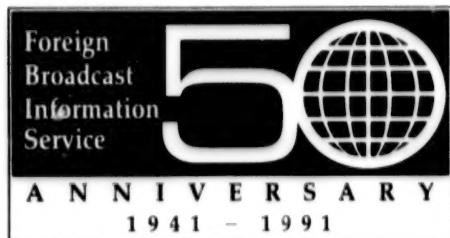


JPRS-TEN-91-008
23 MAY 1991



JPRS Report

Environmental Issues

Environmental Issues

JPRS-TEN-91-008

CONTENTS

23 May 1991

INTERNATIONAL

St. Vincent Hosts International Environment Conference <i>[Bridgetown CANA 2 Apr]</i>	1
St. Vincent Prime Minister on Obstacles to Environmental Education <i>[Bridgetown CANA 3 Apr]</i>	1
Coal in the Environment Conference Opens in London <i>[Beijing XINHUA 4 Apr]</i>	1
Norwegian Group Reports Soviets Storing Nuclear Waste in Kildin <i>[Cologne Radio 2 Apr]</i>	2
Soviet Kildin Island Nuclear Waste Storage Damaging to Environment <i>[Helsinki Radio 3 Apr]</i>	2
Scandinavian R&D Program on Waste Presented <i>[Stockholm NEW SCANDINAVIAN TECHNOLOGY No 4]</i>	2
Finnish Environmental Cooperation With Estonia Planned <i>[Helsinki Radio 25 Mar]</i>	3
Antipollution Convention for Black Sea Drafted <i>[Moscow TASS 29 Mar]</i>	4
South African Researchers To Participate in Global Climatic Studies <i>[Johannesburg Radio 4 Apr]</i>	4
PRC Official Notes Eight Principles for Solving Global Environmental Problems <i>[Beijing RENMIN RIBAO 16 Jan]</i>	4

AFRICA

ZAMBIA

Villagers Reported Eating, Selling Radioactive Beef <i>[Kampala WEEKLY TOPIC 8 Mar]</i>	6
---	---

CANADA

Environment Survey Results Reported <i>[LE JOURNAL DE MONTREAL 10 Mar]</i>	7
--	---

CHINA

Official Views Environmental Protection Situation <i>[CHINA DAILY 28 Mar]</i>	8
Stress on Pollution Control Noted <i>[Hong Kong SOUTH CHINA MORNING POST 29 Mar]</i>	8
'Highlights' of Draft Outline for 8th 5-Year Plan: Environment <i>[XINHUA 5 Apr]</i>	9
Progress Made in Water Pollution Treatment <i>[XINHUA 21 Mar]</i>	9
Acid Rain Situation, Control Strategies Studied <i>[Xu Kangfu, Hao Jiming; HUANJING KEXUE Vol 11, No 1, 28 Feb]</i>	9
Use of Technology in Environmental Protection Stressed <i>[XINHUA 26 Mar]</i>	14
Breakthrough Made in Water Cleaning Technology <i>[XINHUA 26 Mar]</i>	15
Three Gorges Project Plan Review Advances <i>[Hong Kong WEN WEI PO 26 Mar]</i>	15
Coastal Windbreak Forests Built <i>[XINHUA 30 Mar]</i>	15
Pandas To Be Protected by Comprehensive Network <i>[XINHUA 2 Apr]</i>	16

EAST ASIA

AUSTRALIA

Struggle Ahead Over Moves To Relax Uranium Policy <i>[AFP 27 Mar]</i>	17
---	----

JAPAN

Government Studying Introduction of Environmental Tax <i>[KYODO 3 Apr]</i>	17
Mazda To Install 'Unique Powerplant' at New Facility <i>[KYODO 27 Mar]</i>	18
Nissan To Halt Use of CFC's By End of 1994 <i>[KYODO 4 Apr]</i>	18

SOUTH KOREA

National Water Quality Issues Outlined	<i>[THE KOREA HERALD 26-28 Mar]</i>	18
Government To Make All-Out Efforts To Stem Pollution	<i>[YONHAP 29 Mar]</i>	21
Commission Urges No To Issue Declaration on Environment	<i>[YONHAP 2 Apr]</i>	22
More Stringent Punishment Sought for Polluters	<i>[THE KOREA TIMES 4 Apr]</i>	22
Further on Environmental Pollution Penalties	<i>[YONHAP 4 Apr]</i>	22
Lotte Group Accused of River Pollution	<i>[THE KOREA HERALD 4 Apr]</i>	23
Polluting Company 'Likely' To Resume Operation Next Week	<i>[YONHAP 4 Apr]</i>	23
Accord on Soviet Nuclear Waste Disposal Methods Signed	<i>[YONHAP 28 Mar]</i>	23

LAOS

Forest Destruction, Conservation Efforts Reviewed	<i>[VIENTIANE MAI 17 Dec]</i>	24
---	-------------------------------	----

MALAYSIA

Mahathir Urges Minister To Ban Logging in Selangor	<i>[NEW STRAITS TIMES 27 Mar]</i>	24
--	-----------------------------------	----

TAIWAN

Premier Gives Prominence to Environmental Protection	<i>[CNA 3 Apr]</i>	25
--	--------------------	----

THAILAND

National Forestry Policy Committee Formed	<i>[BANGKOK POST 3 Apr]</i>	25
Prime Minister Vows 'Tough Action' Against Wildlife Smugglers	<i>[BANGKOK POST 7 Apr]</i>	26
300 Animals Seized at Chatuchak Market After Anan Visit	<i>[THE NATION 8 Apr]</i>	26
Endangered Species Available at Bangkok Markets	<i>[AFP 12 Apr]</i>	27

VIETNAM

Over 10,000 Cases of Forest Destruction in Thuan Hai Province	<i>[NHAN DAN 2 Mar]</i>	28
---	-------------------------	----

EAST EUROPE

REGIONAL AFFAIRS

CSFR Denies Hungarian Press Agency's Claims Regarding Gabcikovo	<i>[Prague CTK 3 Apr]</i>	29
Dispute Over Experts' Report on Ruse-Giurgiu Pollution	<i>[Sofia BTA 3 Apr]</i>	29
Bulgarian, Romanian Environment Ministers Meet	<i>[Sofia BTA 11 Apr]</i>	30

BULGARIA

Protest Against Belene Nuclear Plant Construction	<i>[Sofia Radio 26 Mar]</i>	30
---	-----------------------------	----

CZECHOSLOVAKIA

IAEA Team Inspects Nuclear Power Plant in Slovakia	<i>[CTK 8 Apr]</i>	30
--	--------------------	----

POLAND

Foreign Debt Converted to Ecology Protection Fund	<i>[ZYCIE WARSZAWY 2 Apr]</i>	30
---	-------------------------------	----

LATIN AMERICA

BRAZIL

Foreign Minister Cites Environment Protection During UK Visit	<i>[Brasilia Radio 6 Apr]</i>	32
Pace of Amazon Region Deforestation Declining		32
INPE Survey Results	<i>[O ESTADO DE SAO PAULO 7 Mar]</i>	32
Golemberg Comments	<i>[O GLOBO 7 Mar]</i>	33
Lumber Companies Fined; Wood, Skins Seized	<i>[Brasilia Radio 1 Apr]</i>	33

BRITISH VIRGIN ISLANDS

Oil Spill Clean-Up Nearing Completion /*Bridgetown CANA 11 Apr* 34

DOMINICAN REPUBLIC

Reforestation Only Remedy for Desertification /*LISTIN DIARIO 22 Feb* 34
Deforestation, Desertification Studied /*EL CARIBE 28 Feb* 35
Coffee Planting Contributes to Deforestation /*LISTIN DIARIO 26 Feb* 36
Substitution of Fossil Fuels Only Remedy /*EL SIGLO 5 Mar* 36

NICARAGUA

5,000 Central American Firefighters on Alert /*Managua Radio 9 Apr* 36

NEAR EAST/SOUTH ASIA

REGIONAL AFFAIRS

Japanese Computer Simulates Flow of Persian Gulf Oil Spill /*Tokyo KYODO 30 Mar* 38
UN To Help Sponsor Arab Environmental Protection Center /*Manama WAKH 31 Mar* 38

BANGLADESH

Coastline Pollution Endangers Fish, Aquatic Species /*Dhaka International 6 Apr* 38

INDIA

Environment Minister Views Pollution Control Plan /*THE TELEGRAPH 13 Feb* 38
Scheme for Labeling of 'Environment-Friendly' Products /*PATRIOT 20 Feb* 39

JORDAN

Water Shortage Threat Outlined /*AL-DUSTUR 25 Feb* 39

PAKISTAN

Government Takes Concrete Steps To Protect Environment /*Islamabad International 5 Apr* 40

SOVIET UNION

Cabinet Measures To Eliminate Chernobyl Consequences /*TASS 5 Apr* 41
Chernobyl Sarcophagus Future Under Discussion /*TASS 2 Apr* 41
Replacement of Chernobyl Nuclear Plant Sarcophagus Projected
/*KOMSOMOLSKAYA PRAVDA 5 Apr* 41
Chernobyl Radioactive Burial Sites To Be Relocated /*TASS 9 Apr* 42
New Fertilizer for Chernobyl-Affected Areas /*Moscow TV 28 Mar* 42
Cossacks Protest at Rostov Nuclear Power Station Site /*KOMSOMOLSKAYA PRAVDA 3 Apr* 43
Projected Tatar Nuclear Power Plant Converted to Organic Fuel /*IZVESTIYA 21 Mar* 43
Moscow Soviet Decides To Close Nuclear Reactors in City /*Moscow TV 20 Mar* 43
Geology Minister Gabrielyants Discusses Resources, Prospecting /*TASS 6 Apr* 44
New Consortium To Become 'Ecological Police' /*I. Semenova; NEDELYA No 7, 11-17 Feb* 44
Greens Protest Over Moscow Environmental Problems /*Moscow Radio 25 Mar* 45
Saiga Herds Seen Endangered by Government Policies, Export Efforts
/A. Shamenov; *RABOCHAYA TRIBUNA 28 Mar* 45
Saiga Horn Shipments to China Seized, Destroyed /*KOMSOMOLSKAYA PRAVDA 15 Feb* 46
Repletion of Bukhara Deer Herds Reported /*TRUD 26 Mar* 46
Scientist on Estonian Pollution Control Bottlenecks /*A. Lane; PAEVALEHT 26 Feb* 46
Kiev Birthrate Down, Death Rate, Radiation Up /*KOMSOMOLSKAYA PRAVDA 26 Mar* 49
Kiev Water Supply Dioxin Content Investigated
/V. Smaga; *KOMSOMOLSKOYE ZNAMYA 5 Mar* 49
Georgian Greens Council Chairman Outlines Program, Accomplishments
/Z. Zhvaniya; *VESTNIK GRUZII 7 Mar* 50
Bratsk Declared 'Ecological Disaster Zone' /*IZVESTIYA 25 Mar* 52

Bashkir KGB Chairman Takes Active Environmental Protection Stance /R. Tukhvatullin, K. Shakhvaliyev; SELSKAYA ZHIZN 13 Mar/	52
More on Consequences of Alleged 1979 Sverdlovsk Anthrax Outbreak /L. Usacheva; POISK No 50, 14-20 Dec/	53
Official Responds to Criticism of 'Aral' Consortium /B.M. Tursumbayev; PRAVDA 28 Feb/	54
Academy of Sciences Official on Probability of Siberian River Diversion Project /S. Ziyadullayev; PRAVDA VOSTOKA 9 Feb/	55
Chairman Outlines Tasks of Kazakhstan's Ecology Committee /M.M. Nurtazin; KAZAKHSTANSKAYA PRAVDA 25 Jan/	56
Mission of Uzbek Environmental Protection Committee Outlined /PRAVDA VOSTOKA 5 Feb/ ..	58

WEST EUROPE

REGIONAL AFFAIRS

EC Adopts Environment Projects /Paris LA LETTRE EUROPEENNE DU PROGRES TECHNIQUE 20 Nov/	60
Nordics Join in Hazardous Waste Project /Stockholm DAGENS NYHETER 8 Mar/	61

BELGIUM

Wallonia To Invest in Waste Treatment Program /Newbury BENELUX ALERT 13 Feb/	61
--	----

DENMARK

Minister Backs Tougher Environment Laws /BERLINGSKE TIDENDE 21 Feb/	61
---	----

FRANCE

Earthworm Method for Garbage Disposal /LIBERATION 5 Mar/	62
--	----

GERMANY

Environment Minister Mandates Stringent Antipollution Standards /FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT 4 Mar/	63
Wismuth Radioactive Waste Removal Costs DM830 Million /Cologne Radio 28 Mar/	63
Cross-Linked Polyurethanes Recycled /Toddington NEW MATERIALS INTERNATIONAL Nov/	63
Cologne University Develops Recycling Process for Varnish Sludge /Wuerzburg UMWELTMAGAZIN Dec/	64
BASF Uses Ceramic Catalyzer for Exhaust Gas Purification /Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT 12 Feb/	64
BMFT To Fund Air Pollution Research Projects /TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN 18 Jan/	65
BMFT Funds Environment-Related Research Projects /TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN 29 Jan/	66

GREECE

Difficulties in Toxic Waste Disposal /I KATHIMERINI 28 Feb/	67
---	----

ITALY

Environmental Monitoring System Developed /I. Giovannini; ECOS Nov-Dec/	67
Waste Disposal Problems Plague South /L'ESPRESSO 3 Mar/	69
Nuclear Energy Research Intensified	70
Nuclear Energy Committee /U. Colombo; ITALIA OGGI 10 Jan/	70
Electric Power Company /ITALIA OGGI 10 Jan/	71

NETHERLANDS

Company Improves Soil Purification Technique /POLYTECHNISCH WEEKBLAD 20 Dec/	72
--	----

PORTUGAL

Particularity in Effluent Treatment Sought /DIARIO DE NOTICIAS 19 Mar/	72
--	----

St. Vincent Hosts International Environment Conference

FL0204155691 Bridgetown CANA in English
1457 GMT 2 Apr 91

[Text] Kingstown, St. Vincent, April 2, CANA—An international environment conference focusing on environmental legislation and St. Vincent's 226 year old botanic gardens, opened here Tuesday with over 450 participants from St. Vincent, regional and international universities, and environmental institutions.

The conference coincides with the 226th anniversary of the founding of the botanic gardens, said to be the oldest in the Western Hemisphere, and the 220th anniversary of the passage of legislation to protect the Kingshill forest reserve to attract rainfall. This piece of legislation is the second oldest in the Western world.

A conference document said the aim of the conference was to "provide a scientific and popular discussion of the horticultural, silvicultural, and agricultural aspects of the history of these environmental institutions, discuss the importance of their social context, (and show how) the values and attitudes which underlay these old institutions (can) be translated into support for new environmental institutions."

In addition, attention will be paid to the role which community groups can play in ensuring biodiversity in the Caribbean in the future. Topics such as historical perspectives on Caribbean environmental issues, the 18th century context of the botanic gardens, and biodiversity and society will be dealt with in lectures and panel discussions. Field tours will also form an integral part of the three day event.

Patrons of the conference are Governor-General David Jack and Prime Minister James Mitchell, coordinator Norma Keizer said.

St. Vincent Prime Minister on Obstacles to Environmental Education

FL0304140591 Bridgetown CANA in English
1137 GMT 3 Apr 91

[Text] Kingstown, St. Vincent, April 3, CANA—St. Vincent Prime Minister James Mitchell has listed poverty and the wholesale importation of foreign technology as major obstacles to environmental education. "Poverty is the greatest catalyst to more poverty. It appears obvious when you witness the stark reality of forest destruction and soil erosion in a place like Haiti, but it is not so obvious when the process is gradual," he said.

Mitchell, who delivered the keynote address at the opening Tuesday of a three-day international conference on environmental institutions in Kingstown, said more destruction has been done to the marine environment than had occurred over millions of years before. He cited

the depletion of lobsters in reefs around the Grenadines and said reef-destruction would eventually lead to damage of the beaches.

Mitchell told the more than 400 delegates that foreign technology is imported for exploitation of resources without ensuring the accompanying education necessary for its effective use and without regard to the local traditions, norms, and culture. He told the meeting that such problems were compounded when fishermen and farmers over-extend their production base to satisfy the tourist industry. But the prime minister said all was not lost once proper use was made of the available education and action was taken on all fronts to halt environmental degradation.

The conference, organised by the National Trust of St. Vincent and the Grenadines, has brought together botanists, researchers, agriculturalists, journalists, and others.

Coal in the Environment Conference Opens in London

OW0404020391 Beijing XINHUA in English
0105 GMT 4 Apr 91

[Text] London, April 4 (XINHUA)—Coal in the Environment Conference and Exhibition 1991 opened here this afternoon with delegates from more than 43 countries and regions participating in it. High on their agenda are discussions and dissemination of information about the latest advances and research findings in clean coal technologies.

A Chinese delegation was invited to be present at the conference.

Opening the three-day world conference sponsored by the British World Coal Institute, a non-governmental organisation, British Secretary of State for Energy John Wakeham said coal is an abundant world resource which makes a vital contribution to global economic development. It also holds a very special place in British industrial history, being instrumental in forging the world's first industrial revolution in Britain.

However, John Wakeham pointed out, coal is now facing a challenge, probably the greatest in its history. Coal burning has now come to be increasingly widely perceived as one of the most damaging of all sources of world environmental pollution, making this conference both extremely relevant and extremely timely, added the British energy minister.

Coal, with gas and petroleum forming one of the three energy resources—fossiled fuels, renewable energy and nuclear power, has been used as a source of energy for many centuries and regarded as a bridge to the future. It is quite cheap at present, not difficult to get and reliable. According to the utility data institute, coal will be the predominant fuel used in new electric power plants

planned or under construction in the European Community. The same is true of the developing world, where coal consumption is forecast to grow by a staggering 48.8 percent per year over the next 10 years with coal constituting the single most important fuel of choice for power generation. Yet, coal burning could lead to acid rain, ozone depletion and greenhouse effect. Improved means of adapting coal to our environment must be found and greater global collaboration in this field is needed.

Before today's official opening, a film on energy and environment was shown. During the three-day conference, there will be also two exhibitions on clean coal technology.

Norwegian Group Reports Soviets Storing Nuclear Waste in Kildin

AU0204115391 Cologne Deutschlandfunk Network in German 1100 GMT 2 Apr 91

[Text] According to information from the Norwegian environmental foundation Benona, the Soviet Union is storing nuclear material from nuclear-driven submarines on the island of Kildin off the coast of northern Europe. Norwegian radio stated today that environmental activists have verified information provided by a KGB officer at a meeting at the beginning of this year. This is the fifth waste disposal site that has become known in this region. The authorities in neighboring Norway were not officially informed.

Soviet Kildin Island Nuclear Waste Storage Damaging to Environment

LD0304155491 Helsinki Domestic Service in Finnish 0900 GMT 3 Apr 91

[Excerpt] [Announcer] New information has come to light in Norway about Soviet nuclear waste storage on the Kola Peninsula. According to the Norwegian environment organization (Bellona), the Kola Peninsula is a ticking time bomb because of nuclear waste from the Soviet Navy and outdated nuclear submarines. From Oslo Ulla- Maria Johansen reports.

[Johansen] According to the newest information from (Bellona), the Soviet Union has stored large amounts of high octane nuclear submarine nuclear waste in front of Murmansk on the island of Kildin about 120 kilometers from the Norwegian border. According to (Bellona), the store has been placed in corridors dug inside a mountain from where the nuclear waste can escape to the Barents Sea and damage the fish stock in the area.

Knut Gussgaard, Norwegian Nuclear Observation Department director, and other Norwegian authorities say that they have no knowledge of the storage on Kildin Island. However, the environment organization (Bellona) claims that the KGB confirmed the existence of these stores as early as last January. In addition to Kildin Island, it claims that the Soviet Union has stored nuclear waste which is damaging to the environment even closer

to the Norwegian border, to Kilpyavr. According to (Bellona), radioactive waste from nuclear icebreakers has been stored here. (Bellona) proposes forming an independent international inspection committee to inspect the security of Soviet nuclear waste storage, and it also proposes cooperation with Soviet authorities. [passage omitted]

Scandinavian R&D Program on Waste Presented

91AN0180A Stockholm NEW SCANDINAVIAN TECHNOLOGY in English No 4, 1990 p 16

[Article: "Nordic Environmental Biotechnology Program"]

[Text] The Nordic countries have started a program of R&D on biotechnology for detoxification and regeneration of waste water and waste of industrial origin. The program is supported by the Nordic Fund for Technology and Industrial Development.

The aims are development and implementation of novel methods and processes in the area of environmental biotechnology; to increase efforts and quality of Nordic R&D in this area; to ensure environmental safety when applying novel methods in environmental biotechnology.

The program is divided into four project areas, each with a project group consisting of four to six R&D groups, with participation by a total of 18 industrial companies in Denmark, Finland, Norway and Sweden. Iceland is participating in the activities of the steering committee and in network activities.

Detoxification of Waste Water From the Pulp and Paper Industry

Biological treatment for detoxification of bleaching effluents will be further developed, aiming at optimization for consortia of active micro-organisms, for both aerobic and anaerobic processes.

Retention of biomass by membrane filtration will be tested, and the biomass manipulated for improved dewatering properties. Co-treatment with high-energy ionizing radiation, ozone and electrochemical oxidation of both waste water and sludge will be tested. Participants are two R&D groups from Sweden, two from Finland and one from Norway.

Degradation of Priority Pollutants in Waste Water and Industrial Waste

Specialized bacteria and their enzymes are developed for bioremediation of waste water and soil contaminated with slowly degradable organochlorines, oil constituents and biopolymers. Inoculation and treatment techniques will be developed for both anaerobic and aerobic processes. Landfill composting, alternating anaerobic-aerobic mixed reactors, and anaerobic sludge bed reactors, will be applied in the studies. One R&D group in each of the four countries is participating.

Biological Removal of Heavy Metals From Mine Drainage, Industrial Waste Water, Waste and Biological Sludge

Biological fixation and separation of toxic heavy metals from mine drainage and bioleaching processes will be developed, based on participation by biogenic sulphide or absorption to microbial biomass.

Removal and regeneration of metals from industrial waste and contaminated soil and sludge by microorganisms expressing high amounts of metal-binding proteins will be tried. A joint feasibility study is being conducted. Two Norwegian, one Swedish, one Finnish and three Danish R&D groups are participating.

Anaerobic Processes for Treatment of Solid Waste

Thermophilic anaerobic digestion of solid waste will be studied for process control and optimization, both fundamentally and by use of large-scale test facilities. Xenobiotic substances present in household waste will be treated by adding dehalogenating microorganisms.

Toxic substances in leachate from landfill operation will be treated by recycling and in fixed-film bioreactors. Two Danish and two Swedish R&D groups are participating.

The Head of the Steering Committee is Erik Bundgaard, of Kruger AS, Denmark. The Scientific Program Coordinator is Morten Laake, Nordic Enviro Science, Norway. The program is administered by the Nordic Fund for Technology and Industrial Development, Oslo, Norway.

Finnish Environmental Cooperation With Estonia Planned

*LD2503223191 Helsinki Domestic Service in Finnish
1600 GMT 25 Mar 91*

[Text] Finland and Estonia have decided on the targets of their environment cooperation. Finland intends to aid Estonia, among other things, with bringing under control the sulphur and nitrogen emissions of the Narva bituminous shale power stations. Finland has chosen four cooperation targets. These are among the worst polluters of the environment in Estonia and their environmental effects extend also to the air and waters in Finland. The progress in environment cooperation was reported by the new Estonian environment minister, Tonis Kaasik, who is on an unofficial visit in Finland, and the Finnish environment minister, Kaj Baerlund, in Porvoo.

[begin recording] [Reporter Susanna Saerkkae] Finland has chosen about 20 environment cooperation targets in the Soviet Union; four of them are in Estonia. After the Kola project, the most important target is the Narva region in Estonia. The sulphur dioxide and nitrogen emissions from the Narva bituminous shale power stations badly pollute Estonia and also southern Finland. In addition to Narva, Finland intends to aid Tallinn in

reducing the burden of the waste waters and in eliminating the environment problems of the Kehra and Tallinn pulp and paper mills and of the town of Kohtla-Jaerve. The environment cooperation projects have been chosen from among scores of Soviet proposals. Environment Minister Kaj Baerlund:

[Baerlund] They have been chosen on the basis of their general environmental effects, and especially on the basis of what effects they have, directly or indirectly, on the environment in Finland.

[Saerkkae] Which one of these four projects in Estonia do you consider the most important, Minister Baerlund?

[Baerlund] In my view the reduction of the emissions of the power stations in the Narva region is overwhelmingly the most important from the viewpoint of the Finnish environment, because these emissions are very great.

[Saerkkae] According to Minister Baerlund, the intention is that the sitting government will still decide both on the order of importance of the environment cooperation projects and also on what conditions and with what funds the cooperation is to be implemented.

[Baerlund] As a whole, it is certainly a question of investing billions, part of which is currency investment and part ruble investment.

[Saerkkae] Minister Baerlund thinks that agreement on the Narva project will be reached as early as this year. Although the cooperation projects have been chosen and decided on, it will not be possible, however, to implement everything.

The new Estonian environment minister, Tonis Kaasik, who is visiting Finland, notes that environment cooperation is also a political issue. For instance, a considerable part of the energy produced by the Narva power stations is exported outside Estonia. Thus Moscow will decide on the framework of the environment cooperation. Estonia will, however, do its best. Environment Minister Kaasik:

[Kaasik] Everything that depends on us, we shall do and we must do. Whether it depends on our money or the ruble, our problem is the currency, there is not enough hard currency. But we trust that cooperation will provide such assistance.

[Saerkkae] In order to avoid the aggravation of political problems, Finland has had talks with both Estonia and Moscow. The Soviet contribution will be decisive for the success of the environment cooperation. Minister Baerlund:

[Baerlund] The Soviet contribution will certainly be very significant because these plants are still very largely under Moscow's control, and without Moscow's cooperation it will be very difficult to achieve effective results.

[Saerkkae] You believe that support will come from Moscow?

[Baerlund] Yes, I do, because we have had negotiations on this matter with Moscow, in addition to the representatives of the near surrounding areas, and I believe that we shall be able to achieve the first concrete results fairly quickly. [end recording]

Antipollution Convention for Black Sea Drafted

LD2903152391 Moscow TASS in English 1243 GMT
29 Mar 91

[By TASS correspondent Valeriy Litvinenko]

[Text] Ankara March 29 TASS—Representatives of Bulgaria, Romania, the Soviet Union and Turkey drafted a convention to protect the Black Sea from pollution and three protocols regulating operations in offshore areas.

The document provides for the elimination or maximum reduction of all pollutants, cooperation in work to combat oil leaks and the exchange of ecologically clean technologies and scientific information.

Under the convention, it is planned to set up a quadripartite commission and a permanent secretariat to coordinate actions by Black Sea countries.

South African Researchers To Participate in Global Climatic Studies

MB0404141591 Johannesburg Domestic Service
in English 1100 GMT 4 Apr 91

[Text] The research vessel SA [South African] Agulhas leaves Cape Town today with a team of ocean researchers aboard who will study the influence of the oceans on South Africa's climate.

Their research forms part of South Africa's contribution to two major international studies on global climate. More than 30 countries are involved in the studies on rainfall and temperature changes which could have a significant impact on agriculture and water resources in southern Africa.

The Department of Environmental Affairs has made money available to scientists at the University of Cape Town to participate in the experiments known as the world ocean circulation experiment and the joint global ocean flux study.

PRC Official Notes Eight Principles for Solving Global Environmental Problems

91WN0312A Beijing RENMIN RIBAO in Chinese
16 Jan 91 p 3

[Article Xie Lianhui (6200 5114 6540): "China's Eight Principles for Solving Global Environmental Problems"]

[Text] A "National Academic Symposium on Atmospheric Change and Environmental Problems," sponsored by the China Scientific Society opened today. At the meeting, Li Xue [2621 4872 6759], vice chairman of

the State Council's Environmental Protection Committee and vice minister of the State Science and Technology Commission, set forth China's eight principles for solving global environmental problems.

Li stated that China was paying significant attention to ecological and environmental protection, has already adopted environmental protection as a basic national policy, and is making an outstanding contribution to protecting the human environment. China very much endorses the United Nations decision to convene a plenary session in 1992 on global environment and development, and will use the international tide towards protecting the global environment as an opportunity to promote ecological and environmental improvement and rationalize the use of natural resources. At the same time, China will search for ways to solve global environmental problems by expanding international cooperation. He believes that solutions to global environmental problems should adhere to the following principles:

- 1) Properly handling the relationship between environmental protection and development. Economic and social development must be based on the sustainable use of natural resources and on a sound ecology and environment. Global environmental issues can only be solved in the course of social and economic development.
- 2) Clarifying primary responsibility for international environmental problems. Present, existing global environmental problems are primarily the consequence of developed countries' blind pursuit of industrialization over the last two centuries. Developed countries are still the major consumers of the world's natural resources and the major sources of pollution. Thus, they cannot be allowed to shirk responsibility for global environmental problems, and should shoulder more real obligations.
- 3) Maintaining each country's sovereignty over its natural resources and noninterference in the internal affairs of other countries. Developing countries cannot tolerate infringements on their sovereignty over their natural resources or the exploitation and use of these resources. They must oppose interference in the internal affairs of other countries under the cause of environmental protection.
- 4) It is necessary to adopt measures ensuring that developing countries can fully participate in activities and cooperate in the international environmental sphere.
- 5) The solution of the environmental problems of developing countries and of the world are of equal importance. They should be given the same attention, and the international community should fully consider the special situations and needs of developing countries. In its unified and coordinated actions, the international community should give strong support to solving developing countries' environmental problems.

6) Environmental protection should not be a new condition attached to the supply of development aid, and should not be used as a pretext for constructing new trade barriers.

7) Developed countries have the obligation, in addition to existing development assistance, to supply ample additional funds to assist developing countries to participate in substantial environmental protection efforts, or to compensate them for additional economic losses due to environmental protection. They should also extend

preferential, non-commercial conditions to developing countries when supplying environmentally sound technology.

8) Relevant international environmental legislation should be established based on ample scientific demonstration and proof, and developing countries should participate in the legislation in order to expand its effectiveness.

Some 300 specialists and scholars from all over the country participated in the meeting.

ZAMBIA

Villagers Reported Eating, Selling Radioactive Beef

91WN0331A Kampala WEEKLY TOPIC in English
8 Mar 91 p 11

[Article by David Musuka "Zambian Villagers Feast on Radioactive Beef"]

[Text] Protein-starved villages in Chongwe, 50 km (31 miles) east of Lusaka, are digging up and eating tins of radioactive beef.

The contaminated meat was buried in the area by the National Import and Export Corporation (NIEC) last October after being declared unfit for human consumption by the Zambian National Council for Scientific Research (NCSR).

The beef, worth US\$500,000, was donated to Zambia by Czechoslovakia in July 1988. It stirred a diplomatic row between the two countries because Czechoslovakia refused to take the meat back.

The Zambian government decided to bury the meat in Chongwe. It was placed in a pit 3.5 metres deep (11.5 feet), 28 metres (92 feet) long and 2.5 metres (8 feet) wide, and covered with a concrete slab. The site was fenced off with barbed wire and warning signs were posted. NIEC officials met with villagers to explain the dangers of consuming the contaminated beef.

A small group of local journalists, who recently visited the area, found more than two dozen villagers using pickaxes to smash the concrete slab to get at the tins.

One villager, Jailos Kabeka, boasted that he and his wife and four children had been eating the contaminated meat for two months. "Why should I feed my family on vegetables when meat is within easy reach?" he said.

Thousands of tins are believed to have been removed from the site and some are said to be fetching as much as two dollars a tin on the black market. Some villagers have stopped working on the land because they believe that they can make more money by retrieving the meat and selling it.

So far, no cases of radioactive poisoning have been reported at either the Chongwe Rural Health Centre or the University Teaching Hospital in Lusaka.

Environment Survey Results Reported

91WN0318.4 *Montreal LE JOURNAL DE MONTREAL* in French 10 Mar 91 p 10

[Article by Jean Denis Girouard: "Canadian Statistics Poll: We Are Being Watched"]

[Text] To administer is to predict. This is why the decisionmakers are closely scrutinizing our changes in attitude in order to save the planet.

Over the past few months, Canadian Statistics conducted a pilot poll of 10,000 Canadian households to better understand the impact their behavior is having on the environment.

These first results are now serving to prepare for another poll, of broader scope, that is to be conducted by Environment Canada in May 1991.

They already have a good general idea of the behavior of Canadians by region in reaction to certain day-to-day situations and now they want to know who these Canadians are: their income, the household furnishings and equipment they have, their demographic characteristics, and how much they pay in rent, among other things.

Furthermore, other polls are already in progress bearing on the methods employed by local administrations to manage waste, the waste management industry, and the expenses incurred in the antipollution campaign by industry.

And next fall a new edition of the publication, "Human Activity and the Environment," a true mirror of the interaction between man and his natural environment, will appear.

The efforts made to conserve energy and water, reduce the amount of waste, or eliminate toxic substances at one and the same time help governments to take the corrective measures that are necessary and industry to plan its production.

These polls are actually marketing studies since—and let us not forget the fact—it is the consumer who has the last word.

Quebec Is Different!

The poll conducted by Canadian Statistics at the end of last year tells us, among other things, that the Quebecois are really different.

The percentage of the population who buy bottled water in the Beautiful Province is 44 percent, or nearly twice the national average, recorded at 23 percent. This average is only 8 percent in British Columbia and 19 percent in Ontario.

Consequently, Quebec and the Atlantic Provinces are tied for last place for users of water filters (8 percent), followed in descending order by British Columbia (13 percent), Ontario (12 percent), and the Prairie Provinces (10 percent). We also learn that the Quebecois buy less recycled paper (19 percent), whereas we find the Ontarians (40 percent) at the other extreme again. Nearly a third of Canadian households said that they buy paper towels or toilet paper made of recycled paper.

It is in Quebec too that composting is least popular: Scarcely one person out of ten indulges in it as opposed to one out of two in British Columbia.

Fifty-two percent of the households of this province with the most favorable climate resort to the technique of composting, as against 24 percent in Ontario, 20 percent in the Prairie Provinces, 16 percent in the Maritime Provinces, and only 10 percent in Quebec.

British Columbia also sets the example with 30 percent of its households bringing their own shopping bags with them to stores, whereas the national average is 21 percent. Ontario and Quebec are next under this heading with 23 and 21 percent respectively, while Saskatchewan occupies last place with 10 percent.

Diapers and Showers

The pilot poll incidentally demonstrated that about 61 percent of young couples with children use only disposable diapers as against 11 percent [who do not]; barely 27 percent of Canadian households have a low-flow showerhead; only 10 percent resort to recycling centers for hazardous products (25 percent in Alberta and two percent in the Maritime Provinces).

Their availability probably also explains why residents of big cities in particular make use of recycling centers.

Half of the households interviewed in Ontario and the Prairie Provinces use pesticides, as against 38 percent in British Columbia, 37 percent in Quebec, and 27 percent in the Maritime Provinces.

And finally, the Canadian Statistics pilot poll indicates that better educated and more affluent people more readily adopt behavior or living habits compatible with conservation of the environment.

Official Views Environmental Protection Situation

HK2803033391 Beijing CHINA DAILY in English
28 Mar 91 p 3

[By staff reporter Xie Liangjun—item as received]

[Text] The shift comes amid fears of a possibly deteriorating environment and growing public attention to environmental problems facing China.

Qu Geping, director of the National Administration for Environmental Protection, said in Beijing on Tuesday that ensuring the positive future of the environment depended on scientific and technological advances.

"We should take effective measures to actively and widely adopt new antipollution technologies and equipment that are acceptable in regard to the country's economic capabilities," Qu said.

Due to the current financial situation, the Chinese Government is unable to afford significant spending on environmental programmes.

Qu urged local environmental protection agencies to place the popularization and application of antipollution techniques developed by Chinese scientists at the top of their agendas.

Antipollution techniques currently practised in China are too outdated and backward to prevent the environment from worsening, though great progress has been achieved in research into environmental science and technology.

Research into environmental science and technology began in earnest in 1973, when the central government first decided to appropriate funds for it.

Qu noted that so far more than 200 institutes engaging in studies on environmental protection have been set up, employing 17,000 Chinese scientists and technicians.

Furthermore, 4,000 pollution-fighting techniques have been developed since 1973 and reported for prospective use to the Information Institute of the National Administration for Environmental Protection.

"But by and large, our know-how in the field lags far behind," Qu pointed out, "and it has not been able to play a significantly supportive role in environmental protection."

China's total investment in environmental protection climbed up to 10.2 billion yuan (about \$2 billion) in 1989 from approximately 2 billion yuan (\$385 million) annually in the early 1980s.

But Chinese environmentalists say that the figure is far from sufficient for the country's arduous crusade against its environmental problems.

The situation has prompted Chinese Premier Li Peng to reiterate that protection of the environment is "a basic

policy of the State" in his government work report to the current session of the National People's Congress on March 25.

Li told Chinese legislators that in the next five to 10 years, efforts must be made to stop and control environmental pollution.

"We must step up publicity and education concerning environmental protection and enhance the popularization of environmental know-how, and thus keep public awareness of environmental protection high," Li said.

Stress on Pollution Control Noted

HK2903034591 Hong Kong SOUTH CHINA MORNING POST in English 29 Mar 91 p 11

[By John Kohut in Beijing]

[Text] China will boost spending on pollution control by about 50 percent during the next five-year economic plan, but the increased funding will not be sufficient to clean up the country's ravished environment.

Mr. Wang Yuqing, Planning Director of China's National Environmental Protection Agency (NEPA), said yesterday that average annual spending on environmental protection by the central and local governments and industry over the next five years would increase to 15 billion yuan (HK [Hong Kong] \$22.39 billion) from 10.2 billion in 1989.

This means that by the end of the current five-year plan (1991-95), spending on pollution control will be equivalent to about 0.8 percent of gross national product, a slight increase from the present 0.67 percent.

Still, such amounts were "very little for the great task of controlling pollution in China", Mr. Wang said.

While China might be able to prevent pollution from increasing, current measures were not sufficient to improve the environment.

A conference on pollution held in Beijing last year noted that many countries with similar or lesser environmental problems spent up to 2.5 percent of GNP [gross national product] on pollution control.

NEPA chief Mr. Qu Geping has previously said China would have to allocate an amount equivalent to 1.5 percent of GNP "just to control the current pollution".

China's dependence on coal for energy has turned the country's major cities into some of the worst polluted in the world.

For example, clouds of smoke over Benxi, Liaoning province, become so thick that the northern industrial city disappears from satellite view for several days at a time.

Mr. Wang said about 14 million tonnes of smoke and nearly 16 million tonnes of sulphur dioxide, the main

component of "acid rain", were emitted into the atmosphere over China each year.

Mr. Wang said China did not have sufficient oil reserves or adequate funds for investment in hydroelectric power to reduce its reliance on coal by the year 2000.

Mr. Wang said despite opposition from many experts, on balance the planned Three Gorges hydroelectric power project on the Yangtze River, expected to boost China's hydroelectric generating capacity by more than 10 percent, would benefit the environment by reducing coal consumption by several million tonnes a year.

In 1989 some 1.6 billion yuan in fines had been collected from enterprises which exceeded pollution limits. However, it was difficult to bring factories into line with government standards because many of them still used antiquated equipment dating as far back as the Japanese occupation in the 1930s and 1940s, Mr. Wang said.

'Highlights' of Draft Outline for 8th 5-Year Plan: Environment

OW0504022591 Beijing XINHUA in English
0213 GMT 5 Apr 91

[“Environmental Protection—23rd of a Series on Highlights of Draft Outline of China's Eighth Five-Year Plan”—XINHUA headline]

[Text] Beijing, April 5 (XINHUA)—Following are the basic requirements for the work in the protection of environment set in the draft outline of the Eighth Five-Year Plan (1991-1995) for National Economic and Social Development expected to be adopted at the current session of the Seventh National People's Congress:

- control air and water pollution and pollution caused by solid wastes;
- take further steps to strengthen the control of pollution of the urban environment by a combination of measures and protection of nature, with the volume of discharge of soot to be controlled at 14 million tons, the volume of discharge of industrial dust kept at less than 7 million tons, the rate of treated waste industrial gas reaching 74 percent, and the utilization rate of solid industrial wastes reaching 33 percent;
- harness big rivers by a combination of measures;
- make further efforts toward the prevention of water loss and soil preservation;
- protect forests, grassland and vegetation in general to check desertification of the land.

Progress Made in Water Pollution Treatment

OW2103125991 Beijing XINHUA in English
0759 GMT 21 Mar 91

[Text] Beijing, March 21 (XINHUA)—China has made new progress in developing technologies for water pollution treatment.

“Water Pollution Treatment and Study of Technologies for Recycling Urban Sewage,” a key research project of the Seventh Five-Year Plan period (1986-1990), has passed state appraisal.

The project, managed by the State Environmental Protection Bureau and jointly carried out by nearly 2,000 scientists from over 200 research units, has yielded 35 internationally advanced scientific findings, with 54 special technologies in the forefront of the field.

The new findings involve the comprehensive treatment and utilization of industrial waste water, oxidizing pool treatment of urban sewage, and the rational use of the purifying function of the natural ecosystem.

The project also provides an overall plan and systematic methods for the protection of water quality in the river system of Taihu Lake in east China's Jiangsu Province.

In addition, the scientists set up 43 experimental bases and 10 demonstration projects, and developed a series of new installations and equipment for environmental protection and pollution treatment.

It is learned that the technologies of the project have been widely spread throughout the country and already brought about significant economic and environmental benefits.

Acid Rain Situation, Control Strategies Studied

91WN01354 Beijing HUANJING KEXUE
[ENVIRONMENTAL SCIENCE] in Chinese Vol 11,
No 1, 28 Feb 90 pp 61-66

[Article by Xu Kangfu [1776 1660 1381] and Hao Jiming [6787 0679 2494] of the Institute of Environmental Engineering, Qinghua University]

[Text] Abstract: This article introduces briefly the control strategies for acid precipitation abroad and the main features of acid rain in China. Based on the effects of the airborne particulates on the composition and acidity of the precipitation, the attention in research should be given to the determination of the sources of the acids and to the main control factors and the selection of the environmental goals. According to the present situation of investigation, the authors proposed a methodology and the principles of a controlling strategy for acid deposition in China.

I. Introduction

In the last decade people have gained understanding of the hazards of acid rain and the effect of SO_2 and NO_x

emission on the acidity of the precipitation. Awareness of the severity of increasing acidity in the environment is on the rise. Effective measures must be taken, including the reduction of polluting emissions, to control the acid rain damages.

Generally speaking, there are two issues in the research of acid rain control. First, as a development in air pollution research, there must be meteorological data of pollution, atmospheric diffusion model and pollutant emission. Second, there should be basic research results, such as the investigation of the acid sources, the correlation between the source and the receiver, and the damage assessment for acid rain on material, ecology and soil. To date, the formulation of basic research has been rather weak.

In foreign countries, the control policy for acid rain appears inactive because the damage mechanism of the environment is not fully understood and the work has just begun. To protect the ecology, lime is applied periodically to the affected lakes and rivers in the United States and in Sweden¹. This is evidently a stop-gap measure rather than a fundamental solution. The fundamental policy should be to reduce the polluting emission, including to reduce sulphur in the fuel, to properly locate the industry and to improve the technology. Some countries in the west are moving in that direction and their policies share the following common features:

1. The emission cutbacks are determined on incomplete data

Due to the complexity of the acid rain formation and the difficulty of quantitative evaluation, it would not be possible within a short term to scientifically assess the permissible level for a given region. The planned cutbacks still await testing and modification. Only through a combination of theoretical and experimental investigation can the cutback levels be optimized.

2. Make thermal electric power plants the high priority and reduce the SO₂ emission first

Of the two acid producing pollutants SO₂ and NO_x, it is sensible to reduce the emission level of SO₂ for reasons of precipitation composition, ecological effects, emission level, and the technical and economic feasibility of

pollutant control. Statistical data show that man-made emission of SO₂ equals to about 50 percent of the natural emission and man-made emission of NO_x is about one order of magnitude less than the natural emission level². Obviously SO₂ is interfering more seriously with the natural cycle. Studies also showed that in the state of Washington in the United States, a state dominated by NO_x emission and where acid rain is nitric, the effectiveness of reducing acid rain by cutting back on the NO_x emission was not as good as reducing the SO₂ emission. (See M. G. Ruby, Evaluation of Acid Deposition Control Policies for Washington, p 153, 1986). It is therefore natural to give the attention to the thermal electric power plants because of their high level of SO₂ emission.

3. Constraints due to social and economic limitations

Pollutant reduction requires great amount of money. Generally available data showed that the investment on de-sulfurization equipment accounts for more than 25 percent of the total investment of a power plant. Large scale cutback of emission will have severe impact on the economy. Therefore, the cutback levels at the various stages should be determined according to the national economic development.

These common features are also the main issues in the acid precipitation control policy. The acid rain control policy for the various periods should be formulated based on the SO₂ emission level in the different regions, the trend and current status of acid rain, the acid resistance of soil and the ecology, and the actual economic and technical level.

II. Present Situation of Acid Rain in China and Policy Research

China made a late start in industrialization; although there is a certain amount of SO₂ emission today, the environmental buffer effect has so far prevented serious damage to lakes and large area forests. Acid rain is wide spread south of the Yangtze River. In cities like Guiyang, Liuzhou, Shaoguan, Pingxiang, Changsha, Chongqing, and Emei, the weighted annual average of the hydrogen ion concentration (pH value) in the rainfall is less than 4.5. This level is comparable to the level in heavy acid rain regions of the United States, Canada and Norway, see Table 1.

Table 1. Annual Average Precipitation Data of Some Chinese and Foreign Cities

Region	Guangzhou	Liuzhou	Shaoguan	Changsha	Chongqing	Emei	New York	Kobe	Norway
pH	4.20	4.45	4.11	4.30	4.44	4.28	3.92	4.40	4.57
SO ₂ /4 (μeq/L)	405.2		93.7		326.6	95.8	125.2	38.5	35.0
NO ₃ ⁻ (μeq/L)	27.9		5.8		27.9	14.5	39.1	24.2	11.0

The acid rain research abroad places the main emphasis on ecological problems such as increased acidity of lakes and the dying of forests. Because acid deposition in the

environment has already manifested itself abroad and the tall chimneys emit considerable pollutants, the emphasis of the research is on the long term transport of

pollutants and their environmental impact. After that, attention may then be given to the exploration of policies to control the acid deposition.

In China the situation is exactly opposite. The air pollution caused by coal burning and low altitude emission have important effects on the acidity of the precipitation. This forms the basic characteristics of China's acid rain, including a multi-centered distribution, a high concentration of ions in the precipitation, a large ration of $\text{SO}_2/4/\text{NO}_3^-$ and a pronounced neutralization effect of the particulates in the ground layer of the atmosphere³. In terms of policy studies, the following problems should be considered:

1. In the study of acid rain sources, one should not use an annual or seasonal weighted statistical process of the precipitation; instead, one should compare the different classes of pollutants.

The annual or seasonal weighted average is a data-processing method used in the acid rain survey. It often leads to conclusions based on geographical origin. In reality there are many factors affecting the acidity of

precipitation. Generally speaking, because of the neutralization effect of the particulates in the atmosphere, the acidity of the precipitation sample is high if the sampling elevation is high and the sampling is timely (taken by opening the collector right after the rain starts and samples collected right after the rain stops). The acidity of the precipitation is greater if the raining time is long or the volume of rainfall is great. In addition, the urban effects of air pollution, such as rain or fog, and the construction and management of urban areas will also make the acidity of urban rainfall greater than that in the rural area. If these effects are used in concluding that cities are the main sources for acid rain in that area, it may be far from the truth.

Moreover, since a local source affects every rain whereas an external source only plays a role when a certain meteorological condition is met, the effects of the external source tend to be lost in the statistics. For example, a joint observation of the spring front rain in the Guangdong and Guangxi areas conducted in February, 1986, showed that the acidity was the highest at the reference point on top of the Baiyunshan, in the upwind direction from Guangzhou, in every rain in Guangzhou. Close to the ground, rain only slightly reduced the acidity due to local emission sources, see Table 2.

Table 2. pH of Rainfall in Guangzhou During Joint Observation

Observation point	Qingyuan	Baiyunshan	City center	Fanyu*
Ave. pH	4.12	3.85	4.79	3.97-4.70

*Range of pH in different rains

These results were drastically different from previous statistics. Considering the fact that acid rain has an effect on the soil and the environment only when the pH value is lower than a certain level, the policy should be based on the frequency of occurrence of strong acid rain and not the total acidity. Improper statistical method can therefore lead to errors in policy research.

Another important problem in the study of acid rain source and formation is the evaluation of the effects of large area air pollution on the cloud water acidity. Similar to the results obtained in simulation experiments for the buffer effect of surface water against acid deposition, the acid added by titration at first did not change the pH value of the water, but after a certain level, additional acid caused the pH to drop rapidly. There will be a similar process in the acidity change of the cloud water, that is, in the beginning there will be a reduction of the cloud water's buffer effect and it is far from adequate to assess the transport effect based on the acidity level only. The buffer effect of the cloud water naturally depends on the air source and path of the air mass, such as the ocean air mass, the land air mass, the southern or northern branch of the westerly wind, and the cyclone or anti-cyclone. Due to the differences in the source and traversed distances, and the difference in the soil history and altitude of the regions the air masses traveled through, the amount and the chemical property of the aerosol carried by the air masses will be different.

For example, a descending airflow moving southward from the northwest plateau will contain more alkaline material. Such differences may help explain the strong acid rain in central south China and vicinity (including southeastern Sichuan) and should be further studied.

Sampling statistics data obtained a few years ago on acid rain showed that among cities with an annual average pH of 5.0 or less, only about one third of the cities had a rainfall acidity higher in the urban region than in the suburban region. (See the final report "Source, effect and control policy for acid rain in China" compiled by Chinese Institute of Environmental Sciences). In order to identify the sources of the pollutants, one must conduct comparison studies of the similarity and difference of pollution meteorology.

2. In the study of the precipitation composition, the neutralization effect of the particulates in the atmosphere should be eliminated; the control target for acid precipitation should be determined through the study of the mechanism of soil acidification.

In foreign countries, the goal for controlling acid precipitation has changed from considering only the acidity in rainfall to include both dry and wet acid deposition, such as the generally accepted $\text{SO}_2/4$ and SO_2 count. The $\text{SO}_2/4$ content and $\text{SO}_2/4/\text{NO}_3^-$ ratio in precipitation in China are generally three to five times of those in

Japan and the United States (See the final report "Source, effect and control policy for acid rain in China" compiled by Chinese Institute of Environmental Sciences). This seems to indicate that the Chinese policy for controlling acid rain should particularly emphasize the reduction of SO_2 emission.

The rainfall composition studies of some Chinese cities showed little correlation of $\text{SO}_2/4$ with H^+ but good correlation with Ca^{2+} and excellent correlation with $\text{NH}_4^+/4$ (See the final report "Source, effect and control policy for acid rain in China" compiled by Chinese Institute of Environmental Sciences). This is consistent with the solubility and chemical stability of ammonium sulfate. Although agricultural experience calls for the application of lime after using ammonium fertilizer, it is relatively certain that SO_2 is the main control factor. Without the correlation of $\text{SO}_2/4$ and H^+ , however, the selection of the control target will be much more difficult. There is a big difference in terms of the polluting source between controlling acid precipitation and controlling sulfur precipitation. It is basically certain that sulfur comes from local sources but the source of $\text{SO}_2/4$ is difficult to determine and quantitative estimates are not yet possible. Regardless of the sources, the effectiveness in controlling the acidity in precipitation by arbitrarily cutting back local emission sources of SO_2 is naturally in doubt; more research is needed. In addition to searching for the correlation between the source, the receptor and the precipitation composition by identifying the sources, the effects of $\text{SO}_2/4$ and H^+ on soil acidity should also be studied by investigating the mechanism of soil acidification. In the study of the precipitation composition, caution should be exercised to observe the neutralization effects of atmospheric particulates over the original acidity sources. Such masking effects should be eliminated as much as possible by monitoring the temporal and vertical distribution. Since the acid in lakes and the dying of forests are both related to the acid in soil and soil composition, and soil composition changes are difficult to reverse, research of soil acidification mechanisms should be done as early as possible so that disasters may be averted.

3. The target for controlling acid precipitation should be the total permissible emission in a region and not the ground level pollutant concentration.

Because of limited availability of data in the research of the source and formation mechanism of acid rain, most researchers build the washing-off acid rain model using the ground level concentration of SO_2 , or the statistical model based on the correlation between SO_2 concentration and precipitation acidity. These approaches may be helpful in exploring the atmospheric chemical reactions, but are inappropriate for policy research because of the following three reasons:

(1) The average SO_2 concentration at the ground level and the average pH in the precipitation lack temporal correspondence

Conventional monitored statistical values of the ground level concentration only reflect the situation of non-raining days. In the rainfall process, the wetting of the tree tops, vegetation coverage and building surfaces greatly increased the adsorbing ability of these surfaces for atmospheric pollutants. In the diffusion process of the pollutants, the pollutants are washed off by the rain water. As a result, the SO_2 concentration near the monitor point usually drops quite rapidly (see Table 3). Acidity in the precipitation, on the other hand, is most obvious when the ground level concentration drops and when the atmospheric particulates are removed in great quantities.

Table 3. Average SO_2 Concentration at Ground Level During Raining Season and Non-Raining Season (mg/m^3)

Observation point	Shaoguan	Baiyun-shan	City center (Guangzhou)	Fanyu
Raining season	0.026	0.003	0.004	0.013
Non-raining season	0.157 (before)		0.038*	
	0.117 (second)	0.010*	0.064**	0.065**
	day after rain)			

*Automatic monitor data of the same month

**Conventional monitoring data of the same season

(2) The acid rain is formed above the city, and ground level atmospheric pollutants have a neutralizing effect on acid precipitation

In the regular monitoring of acid rain, the effects of sampling altitude and sampling time on the acidity have revealed the possibility of a neutralization effect of ground level atmospheric pollutants on the acid precipitation. In the vertical distribution monitoring of acid rain in certain regions, since the effect of topography on the airmass flow has been removed, the increase of precipitation acidity with increasing altitude was quite obvious; thus confirming the neutralization effect that take place in the ground level. As shown in Table 4, with the exception of isolated points, the acidity of water samples taken at the top of 100-meter buildings in Shanghai was generally higher than that in samples taken at the bottom of the buildings. In Guangzhou, the water acidity at the top of the 100-meter television tower was also noticeably higher than that at the bottom of the tower. In a continuous rain, the altitude dependence of the acidity is considerably smaller in the middle and late stage of the rainfall. In some cases, evaporation during the fall caused a loss of water and an increase of the acidity at the ground level. Overall, acid rain is formed above the city where SO_2 , NO_x and converted acidic aerosol are first separated from the coarser grained alkaline particles and the acidification effect is most obvious. On the ground level, atmospheric particulates

increase rapidly due to emission, dust and precipitation confluence; as a result, even though the concentration of acidic gaseous pollutants is high, the washing-off by the rain water still played a certain degree of neutralization effect. The state and the vertical distribution of the acidic and alkaline pollutants obviously prevented the

continued acidification of precipitation in the ground layer; the acid rain in foreign countries also showed the same effect. Using the concentration of the non-acidifying ground level as a representative value is clearly meaningless for the control of the precipitation acidity.

Table 4. Vertical Distribution of Rainfall Acidity Below 100 M

Observation Point Shanghai Municipality		Guangzhou television tower				
		Shanghai building	Shanghai guest-house	Sheshan planetarium	Lianyi building	
	Top	5.08	4.79	4.91	4.33	3.84
Ave. pH						
	Bottom	5.40	5.13	9.32	4.21	4.09
Time period		85-86	85-86	85-86	1986	March 1988

(3) Reducing the ground level concentration and reducing the high altitude pollutants take totally different control measures

Cities with heavy acid rain suffer severe SO_2 pollution. The acid rain intensity and frequency in many southern cities increase during the higher SO_2 pollution season. Considering the atmospheric diffusion situation and the fact that the altitudes of the polluting sources in most cities are similar, the increased intensity and frequency of acid rain are not unusual. Differences and changes of ground level concentration are reflections of similar differences and changes in space. If these characteristics and high altitude point sources are ignored and the attention is focused on reducing the ground level concentration and eliminating low altitude surface sources, the concentration in high altitude will not be reduced and the precipitation acidity control will not be satisfactory.

Obviously the emphases of acid precipitation control and air pollution control are different. In air pollution control the main concern is the ground level concentration of pollutants whereas in acid rain control the integrated effect of acidic and alkaline pollutants along the vertical direction must be considered. To simplify the problem, the environmental and ecological effects on a given region must be studied before a limit can be placed on the total emission level. In cities and areas surrounding polluting sources, the ground level concentration of pollutants must be taken into account. Thus, one approach that suits the situation in China is perhaps to set environmental goals for ground level concentration and total emission level and to search the optimal control and preventive measures that consider both the precipitation acidity and the atmospheric quality. The neutralizing effect of the surface layer for the acid precipitation shows that dry precipitation of particulates and gaseous pollutants in urban areas will have the same net effect. It would be a deviation from the goal of acid rain control if only the sulfur precipitation is controlled and acid precipitation is ignored. If soil acidity studies

can show that the effect of $\text{SO}_2/4$ is indeed important, then the sulfur level should be controlled based on the ground concentration corresponding to the permissible sulfur deposit or based on the atmospheric quality.

III. Principal Policies of Current Acid Precipitation Control in China

Based on the discussion above, the following acid precipitation control policies may be deduced:

1. Based on the principal policy of preventing soil acidity and controlling the total amount of acids, the short term control measures should be consistent with the acid precipitation control and atmospheric pollution control

The consequences of soil acidity cannot be evaluated using the present economic values. In the interaction of soil, ecology and meteorology, the potential damage of soil by the acid rain must be given a high degree of attention. Policies should not be formulated according to the present direct hazards. We cannot permit SO_2 to diffuse unchecked simply because the direct damage suffered by the cities is greater than that suffered by the rural and remote areas.

The control of the total amount of acids is an important issue in atmospheric pollution control research of recent years in China. When the concept is applied to the control of acid rain, a constraint must be added for the total emission. The limit should be determined based on the effect of the emitted pollutants on the precipitation acidity and the environmental ecology of the region under consideration. Because the above effect cannot be quantified at this moment in the short term, control measures may be chosen based on a lateral comparison of the ground level concentration and the different rates of reduction.

2. Develop hydroelectric resources in the southwest in order to control the widespread acid rain in this and adjacent regions

Air pollution and acid rain in China are caused mainly by the burning of coal. Efforts are underway to modify the energy structure on a local level in order to eliminate pollutant emission. For example, coal gasification in the cities, developing coal de-sulfurization technology and combined thermoelectric power, and providing central heating are effective for reducing the ground level acid concentration and sulfur deposit, but one cannot control the precipitation acidity without controlling the increasing trend in the total emission as the economic development progresses. In theory, it would be an effective measure for controlling the acid rain in this region if low sulfur coal from other provinces is used to replace the local high sulfur (greater than 4 percent) low grade coal. However, since it would involve a number of social and economic problems, it can only be used in solving some isolated severe cases of local pollution.

The real solution for controlling the severe acid rain in the southwest is to limit the thermal electric power and to develop hydroelectric power. This area is rich in hydroelectric resources, with an exploitable reserve equal to 70 percent of the national total. According to data obtained by the electric power departments a few years ago, less than five percent of the hydroelectric resources were developed. The main reason for this low level of development was said to be the difficulty in transmitting the electricity from the west to the east. If only this region and the adjacent regions are to be satisfied, the problem would not be hard to solve. Although thermal electric power takes less investment, its economic advantages will be greatly reduced if the costs for controlling the SO₂ emission is also figured in. Hydroelectric power, on the other hand, makes use of regenerative water resources. Hydroelectric power is also inexpensive to operate. The pros and cons are very obvious. It seems that in regions suffering from severe acid rain, rigorous emission control of SO₂ should be imposed on thermal electric power stations in order to promote the development of hydroelectric power.

3. Promote tall chimney emission where appropriate

The simple practice of releasing smoke through tall chimneys is not in itself good for the control of acid rain; an effective measure is to supplement the tall chimneys with de-sulfurization of the smoke. The actual situation may necessitate a phased approach. For example, the reduction of the ground level concentration has become an urgent task in some cities. As a technically and economically viable emergency measure, tall chimneys can be very effective. Judging from the vertical distribution of the wind velocity and the motion of the acidic and alkaline pollutants, tall chimneys will help reduce the precipitation acidity of the surrounding area. Naturally there should be conventional monitor and environmental research to verify the necessity for the next step de-sulfurization. Tall chimneys should be used with prudence in order to avoid redundancy in investment.

4. Conduct engineering demonstration of smoke de-sulfurization for thermal electric power plants in heavy acid rain regions

Conducting smoke de-sulfurization first in thermal electric power stations in heavy acid rain regions has several advantages. First, it helps accumulate engineering experience for future de-sulfurization; second, the recovered sulfur from the high sulfur coal has economic value. Finally, it provides real experimental data for acid rain research. The sulfur emission of a thermal electric power station usually accounts for the bulk of the sulfur emitted in the local region, a sudden reduction of this emission helps to identify the multi-centered acid rain distribution and to explore the correlation between the emission level and the precipitation acidity. These are very important for in-depth studies.

In addition, there are connections and differences in acid rain as a regional pollution problem and acid rain as a local pollution problem. For example, industrial layout should be planned on a higher level based on the acid rain meteorological condition. In terms of emission control, the reduction measure may begin as a local pollution control. In heavy acid rain regions that produce and burn high-sulfur low-grade coal, we may consider promoting boiling furnaces and in-furnace de-sulfurization.

Faced with the continued problem of acid rain, the policy researchers should bring up the problems and their solutions as early as possible so that the solutions may be perfected in repeated practice.

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Use of Technology in Environmental Protection Stressed

OW2603163391 Beijing XINHUA in English
1303 GMT 26 Mar 91

[Text] Beijing, March 26 (XINHUA)—A Chinese environmental protection official today stressed the use of advanced technology in environmental protection activities.

At a symposium on the scientific and technical work of environmental protection which opened here today, Qu Geping, director of the State Administration of Environmental Protection, said that in the past 12 years China has established an initial scientific research system for environmental protection.

Currently, China's more than 200 scientific research institutes engaged in environmental protection employ over 17,000 persons, Qu said. In addition, environmental monitoring centers and various environmental protection enterprises employ tens of thousands of professionals.

However, Qu said, the technology used in China's environmental protection efforts need to be upgraded to control environmental contamination effectively.

According to Qu, China lacks a stable structure for fundamental research, as well as for applied research and popularization research in this regard and the current science and technology administrative system has defects. Qu said that to improve the situation the appraisal, selection, popularization and application of scientific and technical achievements must be accomplished more effectively.

In recent years, the State Council has drafted a series of policies on environmental protection, including the development of a catalog concerned with the monitoring of environmental protection, technology used to control contamination, comprehensive applied technology, environmental engineering, and ecological engineering. The catalog has been used as a basis for the appraisal, selection, and popularization of the scientific and technical achievements.

Qu said that annual investments in environmental protection have increased from two billion yuan in the early 1980s to 10.2 billion yuan in 1989. The figure is expected to continue to rise during the 1990s, said Qu.

Breakthrough Made in Water Cleaning Technology

*OW2603165691 Beijing XINHUA in English
0909 GMT 26 Mar 91*

[Text] Chengdu, March 26 (XINHUA)—A group of Chinese scientists from Sichuan Province have worked out a hi-tech method to clean polluted water, and the United Nations Environment Program has endorsed its spread to other countries, especially Third World nations.

According to the scientists, the new method uses a newly developed compound coagulant to separate dirt from the water.

They said that 70 percent to 80 percent of the cleaned water can be used as recycled water in factories, while the residue deposits can be turned into fuel or used for other purposes.

Three Gorges Project Plan Review Advances

*HK2703025391 Hong Kong WEN WEI PO in Chinese
26 Mar 91 p 2*

[“Dispatch” by WEN WEI PO news gathering group: “Huang Yicheng Talks About the Three Gorges Project”]

[Text] Beijing, 25 Mar—The three gorges project is a hot point with which the reporters are concerned at the National People's Congress [NPC] Session today. Huang Yicheng, minister of energy resources declared that he personally hoped that the three gorges project would be started as soon as possible. He said that the report of the three gorges project had been completed by specialists and would be submitted to the NPC Session for examination and discussion after the examination and approval of the State Council. Now, 90 percent of the specialists hope that it will be started, but surely there are dissenting opinions. As this project is a giant one and it is necessary to completely understand the situation and to take the views of all quarters into consideration, discussion will not be conducted at this NPC Session.

Guo Shuyan, governor of Hubei Province, said that the project will move some 900,000 people to other places and Hubei has now carried out a pilot project and moved approximately 10,000 people away. Most of them have been moved up to local hills without leaving their hometowns. Regarding the speed of the progress in the three gorges project, he maintains that this project can be slightly expedited, but the present method is comparatively safe and some margin is left.

The governor of Sichuan Province declared that everything would be subordinated to the overall interests of the state and hoped that when this key project is started, the interests of the upper reaches, middle reaches, and lower reaches must be coordinated and taken into consideration. A comparatively large area of the upper reaches will be inundated, and it is imperative to properly solve the problem of moving people away.

Coastal Windbreak Forests Built

*OW3003134491 Beijing XINHUA in English
0756 GMT 30 Mar 91*

[Text] Beijing, March 30 (XINHUA)—China has built windbreak forests on more than one million hectares of land located along its eastern coast line in the past three decades, according to an article carried in today's Overseas Edition of the People's Daily.

Thanks to the protection of the windbreak forests, crop lodging has been reduced by 70 percent and the output of rice has been increased by 15 percent.

China has more than 18,000 kilometers of coast line. To speed up the building of coastal windbreak forests and further improve the ecological environment in the coastal areas, the Ministry of Forestry has considered the coastal windbreak project of major national importance.

The project is aimed at planting a total of 3.5 million hectares of coastal windbreaks by the year 2010. It will be completed in two stages. In the first stage (1989-2000), a total of 2.49 million hectares of windbreaks will be planted. The rest of the task will be fulfilled in the second stage (2001-2010).

Pandas To Be Protected by Comprehensive Network

OW0204183891 Beijing XINHUA in English
1444 GMT 2 Apr 91

[Text] Chengdu, April 2 (XINHUA)—China's work to protect giant pandas has entered a new stage, shifting from mainly rescuing endangered pandas to setting up a comprehensive protection and control network.

This was stated by officials from the Wildlife Protection Department in this capital of southwest China's Sichuan Province.

The giant panda is found only in China, mainly in Sichuan but also in Shaanxi and Gansu Provinces.

The officials remarked that in 1983 the pandas living in Sichuan faced starvation with the unexpected demise of much of the local arrow bamboo, their staple food.

The central and local governments at all levels paid great attention to rescuing the rare animals; hundreds of rescue teams were formed and huge amounts of money were poured into the work.

Since then, emergency treatment has been given to 92 pandas, of whom 66 have survived, according to the officials.

Nowadays the arrow bamboo groves are recovering, and the focus of rescue work has shifted to medical research and comprehensive protection.

In zoos throughout the country and in the protected zones Chinese scientists have made progress in breeding giant pandas, including the use of artificial insemination.

AUSTRALIA

Struggle Ahead Over Moves To Relax Uranium Policy

BK2703105091 Hong Kong AFP in English 0753 GMT 27 Mar 91

[By Jack Taylor]

[Text] Sydney, March 27 (AFP)—A new political battle was looming here over moves officials confirmed Wednesday are now under way to abandon Australia's existing restrictions on uranium mining and develop new overseas markets.

A spokesman for Primary Industries and Energy Minister John Kerin confirmed he had told the governing Labor Party it should abandon its present policy and set no limit on the number of new mines.

The existing policy allows mining on three named sites and uranium sales within defined limits.

In a separate development, leaders of Australia's conservative opposition have spent this week in Taipei exploring means of circumventing a ban on uranium sales to Taiwan.

Taiwan is not a party to the Nuclear Non-Proliferation Treaty, which is a government prerequisite for purchasers of Australian uranium yellowcake.

Beijing, which has already expressed its concern to Australia about its increasing business contact with Taiwan, could be expected to protest even more vigorously if Australia started selling uranium to Taiwan.

Mr. Kerin's recommendation for a more liberal policy is certain to rekindle the bitter factional feuding which has characterised the uranium debate here since the mid-70's.

His submission to Labor's Uranium Review Committee referred to "inherent contradictions in our current policy" and urged that future proposals for mining be considered on their merits.

Although Mr. Kerin, an influential right-wing minister, is likely to win substantial support for his recommendation, the whole issue is set to be the most contentious to be debated by Labor's biennial conference in June.

Labor sources say left-wing Labor MP's, including three on the review committee, remain bitterly opposed to any liberalisation of the policy and most want the party to phase out uranium development altogether.

A copy of Mr. Kerin's submission was leaked to and published by a national newspaper Wednesday. His staff said the leaking of the letter was regretted, but confirmed its content.

It said existing policy did nothing to meet concerns about the environment, health and safety, nuclear non-proliferation, aboriginal welfare and returns to the community.

A new policy with strict safeguards would provide a basis "for maximising the benefits to all Australians" from its abundant uranium resources, without compromising the legitimate concerns of the vast majority of party members, the letter said.

Mr. Kerin argued also that Australia's existing policy made no contribution whatsoever to nuclear safety, whereas its active international participation would enable it to play "a very useful role."

In the meantime, opposition leader John Hewson and foreign affairs spokesman Robert Hill are leading a business delegation which has been afforded high level receptions by Taiwanese government ministers and businessmen this week.

As well as trying to help overcome Taiwanese import barriers to Australian agricultural products, the delegation has been discussing uranium supply.

One obstacle is that Australia does not have an embassy in Taiwan because of its "one-China policy," recognising only the People's Republic of China.

But it does have an unofficial trade mission, the Australian Commerce and Industry Office (ACIO) which concluded negotiations this week on direct air links between Australia and Taiwan.

The opposition is looking at the potential for Australia to make use of a bilateral safeguards agreement on which the United States bases its uranium sales to Taiwan.

The opposition initiative is being seen here as a clear indication that if Mr. Hewson's conservative coalition wins power at the next election in two years, it would use the ACIO to develop uranium sales arrangements with Taiwan.

JAPAN

Government Studying Introduction of Environmental Tax

OW0304133191 Tokyo KYODO in English 1110 GMT 3 Apr 91

[Text] Tokyo, April 3 KYODO—The government has begun to study the possibility of introducing a new tax to raise funds for the protection of the earth's environment, government sources said Wednesday.

The sources said the study, being carried out by the Finance Ministry and the Environment Agency, involves new taxes on fuels, industrial waste, and imported lumber.

The two agencies plan to map out a basic scheme in time for the United Nations Conference on Environmental Protection and Development, scheduled for June 1992 in Brazil, in consultation with the Ministries of International Trade and Industry and Foreign Affairs, they said.

The government hopes to revise the existing tax system to include new taxes in fiscal 1993 at the earliest, the sources said.

The study is based on an agreement at a meeting of ministers in charge of environmental protection held in January under the sponsorship of the Organization for Economic Cooperation and Development (OECD).

The agreement called for participating nations to make use of economic measures, such as new taxes and surcharges, to cope with environmental problems such as global warming and destruction of rain forests, the sources said.

The Finance Ministry considers it necessary for the government to establish a comprehensive policy in order to enforce the containment of carbon dioxide emissions at the 1990 level, they said.

They said a similar levy has already been introduced in other countries, such as the Netherlands.

Mazda To Install 'Unique Powerplant' at New Facility

OW2703083391 Tokyo KYODO in English 0808 GMT
27 Mar 91

[Text] Tokyo, March 27 KYODO—Mazda Motor Corp. said Wednesday its new production facility now under construction will be equipped with a unique private powerplant said to be the first of its kind and will feature two newly developed technologies.

The company said the 20,000-kilowatt, energy-efficient, cleaner-burning generator will cogenerate both electric and thermal energy.

The generator, called the steam turbine power generating unit, will use steam, produced by burning coal, to drive turbines and generate electricity.

Unused energy generated daily during low-demand periods will be stored for use during high-demand times, allowing fuel to be burned at a consistent rate around the clock in spite of excess energy, routinely created while the plant is not operating, the company said.

The excess energy will be stored in the form of hot water, at 200 C, under very high pressure of 15 atmospheres, it said.

The stored energy will be restored by the condensed water cooling heat recovery unit to maintain the temperature at the plant and paint blower rooms at a required level throughout the year, the company said.

The system utilizes thermal energy released when the boiler's steam, after powering turbines, recondenses into liquid, allowing the surplus energy to be used to heat water for indoor heating at the plant.

As a result, the fuel consumption rate at the plant being built in Hofu, Yamaguchi Prefecture, will be almost constant throughout the year.

The company said the new system is environment-friendly because it will use a circulating-fluidized-bed type boiler which burns fuel slowly and repeatedly, releasing low levels of carbon dioxide exhaust.

Nissan To Halt Use of CFC's By End of 1994

OW0404122391 Tokyo KYODO in English 1112 GMT
4 Apr 91

[Text] Tokyo, April 4 KYODO—Nissan Motor Co. said Thursday it will replace harmful chlorofluorocarbons used in its cars with pollution-free agents by the end of 1994, a year earlier than originally scheduled.

The major Japanese automaker said the company will be able to complete an in-house system for stable supply of harmless agents within 1994.

The company said it will market cars with air conditioners using pollution-free agents by the middle of this year, and that all cars to be sold at home and abroad will be equipped with pollution-free air conditioners by the end of 1994.

Last year, Nissan announced plans to phase out the harmful agents by the end of 1995.

SOUTH KOREA

National Water Quality Issues Outlined

SK2703011791 Seoul THE KOREA HERALD
in English 26-28 Mar 91

[First in a series of articles on water pollution problems facing the nation by Staff reporter Kim Su-yong]

[26 Mar 91 p 3]

[Text] The dumping of untreated waste phenol into the Nakdong River and the subsequent pollution of the water supply in Taegu has sent shock waves across the nation, driving people to buy bottled water or go to the mountain side for natural spring water.

It has also touched off public outcry and demands for compensation for damages caused by the contamination.

This is the third time the nation has been embroiled in controversy over unsanitary piped water since 1989.

The government made public promises to provide the people with clean tap water whenever tap water pollution hit the headlines: In August 1989, some water plants were reported to have supplied water containing heavy

metals and there were reports that tap water in some places were polluted with high doses of trihalomethane, a known carcinogenic and byproduct of chlorination.

The latest case has infuriated the people over the government's failure to make good its repeated promises.

Up to now, 13,000 industrial firms across the nation have discharged approximately 7.4 million tons of waste water, fouling streams, rivers and the sea; a costly price for the nation's industrialization.

Environmentalists say that the number of plants emitting waste water has increased by an average of 15 percent each year while the amount of waste discharged has risen by some 17 percent.

In particular, some 2,000 industrial plants have produced 210,000 tons of harmful substances such as lead, cadmium and phenol.

The nation has failed to cope with the ever-increasing amount of waste water and pollution of streams and rivers.

A senior [official] of the Environment Ministry even admitted that the country's efforts to control a variety of pollution factors remain at the "primitive" level.

Furthermore, environmentalists share the view that the problem lies in the tendency of many industrial plants to take advantage of loopholes in environment laws and authorities' crackdown on pollutors.

According to the environmental watchdog agency, 10,786 firms spent 279 billion won in waste treatment last year, equivalent to an average of 26 million won per plant.

In contrast, 2,865 firms found to have dumped waste water above the permissible limit were imposed about 9.846 million won in penalties and fines, amounting to some 3.4 million won per firm.

As a result, many firms are not afraid of being subject to crackdowns by authorities concerned because fines or penalties are cheaper than waste water treatment.

Industrial plants are now allowed to continue operations even after being caught for violating waste water limits.

Under environment laws, any firm found to have dumped their waste without treatment faces only up to 10 days of suspended operation. Only after being detected for dumping untreated waste three times, will they have their business license revoked.

What is more serious is the shortage of crackdown manpower and outdated detecting devices, environmentalists said.

According to government figures, 1,200 people, including 400 from the Environment Ministry, are in charge of controlling businesses and industrial plants discharging water and air pollutants. The number of

government officials active on crackdown teams is quite low, given the fact that the total includes desk-bound officials.

In case of the Ulsan branch of the Pusan District Environment Administration, only eight staff cover 737 waste-emitting firms in the industrial city.

Many firms are said to go without regular checks on their antipollution facilities during the whole year.

Most pollution control teams as well as water purification plants suffer a shortage of testing equipment.

Inspection teams in most cities and counties in Cholapuk-to have no testing devices of their own to measure pollution, so they have to send samples of water to city or provincial government-run environment research institutes for testing.

There are 68 industrial plants discharging phenol into upstream Nakdong River water purification plants, the supplier of tap water for Taegu citizens.

Regular checks by Taegu City and the district environment agency have found no phenol since 1986, well reflecting the serious problems with control efforts by authorities concerned.

The prosecution found that Doosan Electro-Materials Co. which dumped large amounts of phenol into the Nakdong River, causing the latest tap water contamination case, has operated a secret conduit to discharge untreated waste since 1984.

Doosan underwent regular checks seven times, but the firm was fined 100,000 won for not keeping records on treating waste only once.

[27 Mar 91 p 3]

[Text] The nation, called "kumsugangsan" by generations of Koreans, literally meaning a land of embroidered rivers and mountains, is now turning into fouled land with smelly rivers and mountains strewn with garbage, with emphasis placed on economic development, without due consideration of environmental protection.

No water in the nation's 20 major water purification plants is categorized as first-class, which requires only a simple treatment process.

The water quality of the Paldang Reservoir, supplying tap water for Seoulites and nearby residents and once considered the best, has already been downgraded to second-class.

Other plants face a starker reality: their untreated water quality has fallen to third- or fourth-class.

According to the Environment Ministry, the nation's four major rivers—the Han, Nakdong, Kum and Yongsan—are now "dying," and have an ever-shrinking self-purification ability.

In the past, organic substances which melt down or dissolve voluntarily with the passage of time were the biggest polluters of the rivers.

But now an increasing amount of heavy metals and other harmful substances are flowing into water purification plants, as shown in the tap contamination in 1989 and recently.

Environmentalists say toxic chemicals and heavy metals kill aerobic bacteria which disintegrate organic substance.

As a result, they say current measuring methods such as the biochemical oxygen demand (BOD) and chemical oxygen demand (COD), which depend on measurements of the concentration of organic substances, are ineffective in testing how polluted rivers are.

Environmentalists brush aside authorities' contention that the water quality is improving because of declining BOD and COD levels.

They claim that the government should establish steps to cope with toxic chemicals as well as organic substances.

Since the early 1980s, environmentalists have maintained that major rivers and streams contain harmful substances, including heavy metals, but authorities concerned have flatly denied it.

But a survey conducted by the Pusan District Environment Administration last September officially confirmed for the first time that 0.043 ppm of chrome (VI), a toxic effluent for metal planting, was detected in the Nakdong River.

A report that the cancer-causing substance, phenol, up to 38 times the official limit, was measured in the Nakdong River during the latest tap water contamination also came as a shock.

A recent survey, conducted by the Korea Tap Water Research Institute last December, indicated that five water purification plants, including the Paldang Reservoir, were contaminated with 11 kinds of toxic substances, including radium, a radioactive material.

The institute conducted the survey at the request of the Seoul City administration, to collect data on harmful substances.

Environmentalists share the view that water purification plants should be equipped with the water treatment facilities to filter these harmful substances.

There are 686 water purification plants across the nation, 60 percent of which are more than 10 years old. Some are obsolete.

Such worn-out purification plants are unable to filter toxic substances and heavy metals in the course of treating low-quality water.

Officials with water purification plants acknowledge that they check 14 areas, including color, taste, pH and dissolved oxygen—things easily tested daily.

The team, comprising four academics and three citizens was headed by Prof. Kwon Suk-pyo of Yonsei University.

Environmental authorities acknowledged the need for introducing the high-tech treatment methods, but are hesitant because of budget constraints, saying that these tests cost 10 times as much as the conventional treatment system.

[28 Mar 91 p 3]

[Text] Many people are asking why the prosecution does not arrest the president of Doosan Electro-Materials Co., the main culprit of the controversial phenol contamination of the Nakdong River.

Simply, there is no legal basis on which to do so.

The Water Quality Preservation Law and other laws which regulate pollution and contamination of nature have no provisions for the punishment of owners of waste-emitting firms. Thus, they are only subject to fines.

The Water Quality Preservation Law does, however, carry a five years' jail term or a maximum 30 million won fine against "working-level officials directly involved" in the illegal dumping of untreated wastes.

The law also calls for a 10-day suspension of operation for companies found to have illegally discharged untreated toxic chemicals.

Prosecutors point out that dumpers of toxic wastes cannot be punished under the current law unless the wastes were "intentionally" discharged.

Environmentalists argue that the current law is too light on those illegally emitting toxic chemicals, saying the environmental problem is emerging as one of the greatest public concerns.

They said that severe punishment of the "owners" or chief business executives of waste-discharging companies would be the only effective way to protect the environment.

In many cases, working-level officials of industrial firms have reportedly been forced by their employers to discharge toxic chemicals without treating them, they claimed.

Legal experts say that the problem lies in the current law which holds such offenders not in the light of criminals but as those subject to "administrative" punishments.

They also stress the need to impose harsher administrative measures, including cancellation of business licenses and shutdown of companies emitting pollutants.

Prof. Sin Tong-un of Seoul National University's Law School, say that those engaging in polluting industries tend not to feel a "sense of Guilt" for releasing toxic wastes.

"That's partly because the current law punishes the illegal dumping as a violation of administrative regulations unlike in Western developed countries where such acts are regulated by stiff penal codes," Sin said.

He suggested that the National Assembly enact a special law, as in Germany, which charges owners of waste-emitting firms on criminal grounds.

Lawyer Yi Sok-tae also spoke of the need to introduce a special law similar to Japan's Pollution Crimes Punishment Law.

Lawyer Yi insisted that the government will have to charge expenses necessary to compensate for the damage caused by the Nakdong River contamination to polluting companies in Kumi, Kyongsangbuk-to, as well as Doosan Group.

Yi based his claim on the provisions of the current law which allows government authorities to charge companies operating near a contaminated area for compensation when the source of the contamination is not clear.

He also proposed that the prosecution put behind bars the owners of waste-emitting firms by applying the Waste Control Law.

Yi's claim counters the prosecution's explanation on why the owners of waste-emitting companies cannot be put behind bars.

Aside from lack of provisions in the prevailing law for the punishment of illegal dumpers, legal experts say, the prosecution seems to have failed to do its utmost in trying to subdue the evergrowing public outcry over the Nakdong River contamination case.

Critics have doubts on the prosecution which conducted only a brief interrogation of Yang Yu-sok, 52, former president of Doosan Electro-Materials Co., March 20.

The prosecution at the time released Yang, saying he was found to have had no knowledge of the illegal dumping.

The prosecution should have further interrogated Yang to determine the validity of the allegation that he was responsible as he had rejected several requests made by working-level officials to repair the broken-down anti-pollution device, critics say.

The prosecution's will to sternly punish environmental officials, who were in charge of inspecting Doosan and other waste-emitting firms in the Kumi Industrial Complex, also came under fire.

Critics say the arrest of seven officials of the Taegu Environment Administration will not suffice to serve a stern warning against possible polluters; the prosecution

charged them only with the fabrication of official documents which carries light punishment.

Government To Make All-Out Efforts To Stem Pollution

SK2903124891 Seoul YONHAP in English 1218 GMT
29 Mar 91

[Text] Seoul, March 29 (YONHAP)—The government will make all-out efforts to help the domestic industry adapt to the ever-intensifying international war on pollution, expediting technology development and industry restructuring. Economic Planning Board [EPB] officials said Friday.

In an inter-ministerial meeting on industrial policies presided over by Deputy Prime Minister-EPB Minister Choe Kak-kyu, it was decided that tax and financial support would be given to firms developing substitutes for materials subject to international ban and establishing anti-pollution facilities and equipment.

Policy support will be provided to firms keen on development of ultra-modern technologies requiring low energy consumption. Also in line for government support will be firms manufacturing materials and equipment that save energy while offering high added value. Investment in research and development of solar, wind and tidal energy will be expanded.

To work out comprehensive measures in response to the international efforts to deter environmental contamination, a committee will be formed under the vice EPB minister, comprising officials from foreign, finance, agriculture-forestry-fisheries, trade-industry, energy-resources, construction, transportation and environment ministries.

The committee will put the prime emphasis on enhancing the nation's access to such international efforts to curb environmental deterioration as the 1989 Basel Convention on the control of transboundary movement of hazardous wastes and their disposal, the 1987 Montreal protocol on substances that deplete the ozone layer, and the convention on the conservation of biological diversity are now in the making.

The committee will also positively respond to the international efforts to create a framework convention on climate change, particularly global warming.

According to EPB officials, little efforts have been so far made in the nation to produce substitutes for energy sources emitting methane, carbon dioxide, chlorofluorocarbons and other harmful gases.

An estimated 86.6 billion won will be needed to develop substitutes that will meet the nation's need of freon, whose use was frozen by the Montreal treaty.

The domestic market of chemicals whose use is restricted under the Montreal treaty is sized at 40 billion

won, but impact of the treaty is expected to spill over to a wide range of related industries valued at 4 trillion won, the officials said.

Commission Urges No To Issue Declaration on Environment

SK0204064291 Seoul YONHAP in English 0555 GMT 2 Apr 91

[Text] Seoul, April 2 (YONHAP)—The Presidential Commission on the 21st Century Tuesday urged President No Tae-u to issue a declaration to awaken the public to the need for environmental protection.

The commission also called on the president to appoint a special adviser on scientific and technological affairs, and said sewage disposal and waste treatment should be handed over to private companies by the government.

It said the state-run National Institute of Environmental Research should be privatized and expanded so it can study environment problems independently and comprehensively.

The committee also called for inter-Korean prospecting on the continental shelf, joint study of the ecology of the demilitarized zone, and setting joint industrial standards.

After being briefed on the report, No said the government would strongly seek to improve its environment watch system, the education of environment experts and support for environmental research institutes. He said the government would continue to expand investment in science and technology.

More Stringent Punishment Sought for Polluters

SK0404035091 Seoul THE KOREA TIMES in English 4 Apr 91 p 1

[Text] Those who pollute rivers and destroy the environment face sterner punishment of up to seven years in prison or 50 million won in fine instead of five years behind the bars or 30 million won.

It was agreed upon in a meeting of leaders of the Cabinet and the ruling Democratic Liberal Party yesterday. To this end, the revision of relevant statutes is sought during a special National Assembly session to open on April 15.

The government and its party discussed a wide range of pending issues such as environmental protection, strategy for the upcoming special House session and measures of arresting price hikes in their meeting.

The two sides agreed to wrap up the amendment of the reform bills such as the National Security Law and the Law of the Agency for Security Planning during the upcoming House session.

However, they agreed not to seek criminal action against the owners of business firms even though their plants are found to have polluted rivers because of fear of discouraging business activities.

In the meeting participated in by party leaders and Cabinet members led by Prime Minister No Chae-pong, they expressed concern about inflation, fearing that the base of stability will be shattered if no proper action is taken.

As a result, the two sides agreed to keep money supply growth below 17 percent, about 2 percent lower than the projected maximum increase.

The reform bills which the two sides agreed to amend include the National Security Law and Law of the Agency for National Security Planning, which were billed by the opposition camp as being undemocratic.

The opposition camp has long demanded "relaxation" of the laws to be consistent with the change in the security situation in and out of the nation.

Further on Environmental Pollution Penalties

SK0404042991 Seoul YONHAP in English 0044 GMT 4 Apr 91

[Text] Seoul, April 4 (YONHAP)—Government and ruling party leaders have decided to seek up to the death penalty, or life imprisonment, for people who intentionally discharge toxic waste, resulting in death or injury.

They also decided Wednesday that the environmental preservation law's provisions on water pollution needed revising to increase the penalty on firms that release pollutants.

Current regulations provide for up to five years' imprisonment or a maximum 30 million-won fine. The meeting agreed to propose up to seven years imprisonment or a maximum 50 million-won fine.

Environment Minister Ho Nam-hun said the nation's major water resources would be equipped with automatic quality testing equipment for prompt detection of problems.

The meeting was also attended by Prime Minister No Chae-pong, Deputy Prime Minister and Economic Planning Minister Choe Kak-kyu, Home Minister An Ung-mo, Finance Minister Chong Yong-ui, Justice Minister Yi Chong-nam, Labor Minister Choe Pyong-yol, Information Minister Choe Chang-yun and other ministers and presidential secretaries.

From the Democratic Liberal Party there were Executive Chairman Kim Yong-sam, Co-Chairmen Kim Chong-pil and Pak Tae-chun, chief policymaker Na Ung-pae, floor leader Kim Chong-ho and others.

On other matters discussed in the meeting, Deputy Prime Minister Choe said the money supply would be

restricted at 17 percent to 19 percent by trimming the budget or postponing implementation of large projects.

As a heated construction market is one of the major culprits of inflation, the government will not issue permits for the construction of commercial buildings until the end of June.

Participants agreed to encourage private investment in power plants to prevent a shortage of electric power. The electricity reserve is feared to fall below 2 percent this summer.

Lotte Group Accused of River Pollution

*SK0404030791 Seoul THE KOREA HERALD
in English 4 Apr 91 p 3*

[Text] Chonju—Lotte Ham & Milk Products Co.'s Chonju plant is accused of having discharged illegal amounts of untreated waste water into the upper reaches of the Somjin River.

Imshil County authorities Tuesday filed with the Chonju District Prosecutor's Office a complaint against the plant, a subsidiary of the giant conglomerate Lotte Group.

According to the complaint, Lotte Ham & Milk is alleged to have diluted waste with underground water in a bid to drop the contamination degree of the discharged waste below the Environment Ministry-set permissible limit.

County officials said the plant allegedly creates 940 tons of waste a day in the course of processing 190 tons of raw milk.

The plant was caught discharging the waste into the Owon Stream in the upper reaches of the Somjin River on the night of last March 29, county officials said.

The officials said they could not confirm whether the emitted waste exceeded the permissible contamination level, but they decided to file a complaint against the plant since the waste visibly appeared to be unclean.

Plant officials rejected the charge, saying that dirty water was discharged during a project to raise the plants waste treatment capability to 2,500 tons from 1,000 tons, and all treated waste flows through the septic tanks of their waste treatment facilities.

The prosecution sent to the Chollabuk-do Health and Environment Institute samples of the waste, collected by the county authorities, for testing.

Prosecutors said they would decide whether to launch an investigation into the factory officials responsible for treating waste according to the results of the testing.

Polluting Company 'Likely' To Resume Operation Next Week

*SK0404082491 Seoul YONHAP in English 0647 GMT
4 Apr 91*

[Text] Seoul, April 4 (YONHAP)—Doosan Electro-Materials Co., slapped with a 30-day suspension March 26 for dumping phenol into the Nakdong River, is likely to resume operation early next week.

Deputy Prime Minister Choe Kak-kyu said Wednesday the government planned to revoke the suspension immediately [once] it had repaired its phenol treatment facility, since other companies were suffering as a result.

The Doosan Group subsidiary makes 80 percent of the copper-clad laminate used in Korean televisions and videotape recorders.

Choe, who is also economic planning minister, notified Doosan Chairman Pak Yong-kon of the decision on Tuesday so the company could be back on its feet within a week.

Choe also said the government would seek a supplementary budget of 204 billion won (281 million U.S. dollars) this month for the promised 280 million dollars in additional support for the Gulf war.

Accord on Soviet Nuclear Waste Disposal Methods Signed

*SK2803063691 Seoul YONHAP in English 0512 GMT
28 Mar 91*

[Text] Seoul, March 28 (YONHAP)—Soviet technology for disposing of nuclear and industrial waste in caves may soon be imported by South Korea under an agreement between Korea Trade Leader Co. and an unnamed Soviet research institute.

Officials of the trading company said Thursday they had already initialed an agreement with the research institute to acquire the know-how to create approximately 1,000 subterranean chambers of one cubic meter each for nuclear and industrial waste.

The officials declined to name the institute, saying details of the deal would be announced after the company had submitted a technology import plan to the Science and Technology Ministry early next month.

One official said the institute had recently gone private. The company also refused to say how much money was involved.

The Soviet method has proven successful and came into wide use after the Chernobyl accident, they said. It involves locating a geological structure containing sand 350 meters to 500 meters below the surface and then creating a cave in it with a controlled explosion.

The blast turns the sand into a hardened substance that is leakproof, the officials said.

Such projects require only small surface area, no more than 10 meters square, and uninhabited islands off the west coast have geological features that make them possible sites for such waste dumps, they said.

The caves could hold dangerous industrial or radioactive waste, they said.

The government scrapped plans to construct a temporary nuclear dump site on Anmyondo, a small island off the west coast, last November after violent protests by residents.

LAOS

Forest Destruction, Conservation Efforts Reviewed

91WN0332A Vientiane VIENTIANE MAI in Lao
17 Dec 90 p 2

[Conversations With Our Readers column: "There Are Still 250,000 Families Cultivating Dry Field Rice"]

[Excerpt] There is still serious damage being done to the forests and environment of the LPDR [Lao People's Democratic Republic]. Each year at least 300,000 hectares of forest is destroyed by the clearing done for dry field rice. Listen to the report of Mr. Inkong Mahavang, the Minister of Agriculture and Forestry, to the assembly discussing the tropical forests project on 13 December concerning the government's policies:

The government of the LPDR realized that forestry and protecting the environment were not beneficial just for the LPDR but were also beneficial for all the countries in the southern Mekong River basin and the countries in this area as well as the countries of the world. With regard to the activities related to forestry and protecting nature and the environment in the future up to the year 2000, Mr. Inkong Mahavang said that:

What caused the most concern at present involved the 253,000 families which were making a living by slash and burn agriculture and each year were clearing not less than 300,000 hectares. The burning of the forest and the careless cutting of trees continued unabated and so the area of forest throughout the country and especially in the North and the East had been steadily declining. This had caused environmental change, for example the temperature had risen, rivers and streams had dried up, there had been continuous droughts and floods, there had been serious erosion, the fish and the animals had lost natural habitat, and production and the living standard of the people had suffered seriously.

Faced with this problem the government has had to induce the multi-ethnic people in the mountain areas engaged in slash and burn agriculture to turn to other more secure professions. This did not mean that they had to move. They could engage in forestry, agriculture, animal husbandry etc. Land has been distributed which could be used for these professions on a fixed basis. These changes brought the demand for roads, irrigation,

land for crops or animal husbandry, clean water, hospitals, markets, credit, and technology.

There were more than 10 million hectares of unused land and barren hills which were being washed away and eroded by the rain in the rainy season. This caused sudden floods, dry, hard soil and could cause forest fires in the dry season. The government had a policy of distributing unforested land to the multi-ethnic people and to people wishing to invest in agriculture, animal husbandry or reforestation. They had been assured that what they built would belong to them. They had the right to pass it on to their descendants or transfer it to others.

Because of the restrictions, they stopped exporting logs. These will be sent to industry for processing and then the finished product will be exported abroad. The old sawmills which did not process the wood efficiently will be modernized so that they can use all the wood, even the scraps, branches and stumps. [passage omitted]

MALAYSIA

Mahathir Urges Minister To Ban Logging in Selangor

BK2903092391 Kuala Lumpur NEW STRAITS TIMES
in English 27 Mar 91 p 1

[By Abu Yamin Salam]

[Text] Klang, Tues.—Prime Minister Datuk Seri Dr. Mahathir Mohamed has advised the Selangor Government to impose a total ban on logging activities to safeguard the environment and ensure sufficient water catchment areas in the State.

The advice was given in a meeting with Selangor Menteri Besar Tan Sri Muhammad Haji Muhammad Taib at his office today.

Tan Sri Muhammad told the NEW STRAITS TIMES that the State Government would study the suggestion and come up with a decision in about two months.

The Menteri Besar, who indicated that the Prime Minister's advice was favourable to the State Government, said a committee would be set up immediately to study the matter.

"We will make this a priority as we too feel that steps have to be taken to maintain the greenbelts and forest reserves in Selangor and the Klang Valley," he said.

A total ban will result in Selangor losing \$10 million annually in revenue, but Tan Sri Muhammad said the amount was negligible compared to the benefits the public would get if the forest reserves and the greenbelts were preserved.

He added that the State Government last year decided to stop issuing new logging permits for the next three years to enable the State Forestry Department to carry out rehabilitation programmes.

About 400,000 cubic metres of timber were extracted in 1989. The Menteri Besar said only one percent of the area under forest in the State was for logging.

At the meeting, Tan Sri Muhammad briefed Dr. Mahathir on the status of the Sungai Buloh low-cost housing project by the Selangor Development Corporation which had caused a furor among environmentalists.

Tan Sri Muhammad said the Prime minister wanted the State Government to preserve the 1,000 ha of forest reserve and water catchment areas in Sungai Buloh as suggested by the Department of Environment, but he did not object to the housing project.

Tan Sri Muhammad said the State Government last year gazetted 72,000 ha of forest in Sabak Bernam as permanent forest reserve.

The new forest reserve, which is made up of the Raja Musa and Sungai Karang forest compartments, will serve as catchment area for the South West Agriculture Scheme covering Tanjung Karang, Sungai Besar and Sungai Panjang, where some 250,000 people grow rice twice a year.

The new area increases Selangor's gazetted forest reserves to 242,655 hectares; or 31 percent of its total land area.

Other forest reserves designated as catchment areas are located in Ulu Selangor, Ulu Godmbak, Ampang, Ulu Langat, and Sungai Lalang.

TAIWAN

Premier Gives Prominence to Environmental Protection

OW0304114991 Taipei CNA in English 0817 GMT
3 Apr 91

[Text] Taipei, April 3 (CNA)—Premier Hau Pei-tsun said environmental protection and economic growth are on equal footing, but when economic development has to be at the expense of environment, "we would rather sacrifice economic growth."

Hau made the remarks at the Legislative Yuan Tuesday evening in reply to an interpellation by Kuomintang legislator Chao Shao-kang.

"Pollution can be allowed as far as it is under control. Beyond that boundary, we must forsake economic growth," Hau said.

Talking about state-run enterprises' efforts to solve their disputes with locals over pollution problems, Hau said, Taiwan Power Company set a bad example last year when it chose to just "give away money" in a dispute with residents near its Kaohsiung plants, instead of helping them find a solution to their problem.

From now on, he said, apart from compensations, "efforts should also be made to ensure that local residents will accept the presence of such enterprises near their communities," he added.

Hau also said he will not consent to proposals by Chinese Culture University and Shih Chien College to move their campuses to the Feitsui Reservoir area because it is "extremely important" to keep the area from being polluted.

Feitsui Dam, upstream of the Hsintien River, supplies tap water to residents throughout the Taipei metropolitan area.

THAILAND

National Forestry Policy Committee Formed

BK0304024791 Bangkok BANGKOK POST in English
3 Apr 91 p 7

[Text] Cabinet yesterday approved the appointments of Deputy Prime Minister Sano Unakun as head of the new National Forestry Policy Committee and Agriculture Minister Anat Aphaphiroma as chairman of the Committee for the Protection and Prevention of the Exploitation of Forestry Resources.

Mr. Anat said the 32-member National Forestry Policy Committee was responsible for the formulation and coordination of forestry planning nationwide, the guidelines and management of forestry resources, as well as conservation efforts.

The committee also would specify measures for conservation of the forest and environment, including soil, water, flora and fauna, as well as the prevention of natural floods and erosion.

Members were assigned to make suggestions to Cabinet about forestry conservation, such as the application of science and technology to reduce forest destruction, and establishment of clear boundaries for forests to guard against further encroachment.

The committee also would nominate a forest area with an average slope of 35 percent as a watershed area for which no land documents would be issued, to promote reforestation by the private sector, he said.

Other appointed committee members were Agriculture Minister Anat and Interior Minister Itsaraphong Nunphakdi as co-chairmen, Prime Minister's Office Minister Michai Wirawaithaya, Agriculture Deputy Minister Khosit Panpiamrat, and the Permanent Secretaries for Agriculture, Interior and Science, Technology and Energy.

The remaining members were from authorities related to forestry, the armed forces, the Forestry Department and forestry academics and experts.

Mr. Anat said the Committee for the Protection and Prevention of the Exploitation of Forestry Resources was responsible for proposing guidelines to Cabinet about the prevention of forest destruction and for setting up measures for protection and suppression work.

It also was allowed to probe officials suspected of malfeasance, to improve and correct related forestry laws, to provide land for farmers living in deteriorated forests and to accelerate reforestation and forest rehabilitation, he said.

The committee was co-chaired by Minister Michai Wirawaithaya, Deputy Interior Minister Anan Kalintha and Deputy Agriculture Minister Khosit Panpiamrat and representatives from the Supreme Command.

Other members were the Permanent Secretaries for Agriculture and Interior, as well as 18 others from related agencies, the armed forces and the Forestry Department.

Prime Minister Vows 'Tough Action' Against Wildlife Smugglers

BK0704005591 Bangkok BANGKOK POST in English 7 Apr 91 p 3

[Text] Prime Minister Anan Panyarachun yesterday vowed to take tough action against poachers and smugglers of wildlife following reports that the British-based World Wide Fund for Nature had launched a campaign to stop the illegal wildlife trade in Thailand.

Mr. Anan, accompanied by Deputy Prime Minister Sano Unakun and Prime Minister's Office Minister Michai Wirawaithaya, visited the weekend market at Chatuchak Park where wildlife trading was reported to be rampant.

"We do not agree with nor allow illegal wildlife trading. Every government is duty-bound to conserve wildlife," Mr. Anan said.

"We will seriously take action to solve this problem," he added.

Mr. Michai said it was time to take drastic action against poachers and smugglers.

He said that what had happened was due to the fact that existing Thai laws on wildlife were too weak to control illegal wildlife trading and smuggling.

"The Prime Minister and Agriculture Minister have discussed this matter and agreed to amend the Wildlife Act to protect wildlife, be they of Thailand or smuggled from abroad, from extinction," he said.

Mr. Michai said the Agriculture Ministry would amend the law to bring it into line with international requirements to protect wildlife.

He said he expected heavier penalties in the amended law which would be designed to stop the import and transit of endangered species into and through Thailand.

A public relations campaign would be launched to wean people off their desire to eat game meat and raise wild animals, he added.

The existing law allows each house to have not more than two wild animals. The amended law is likely to prohibit raising wildlife, but special permission may be granted to certain organisations or foundations, Mr. Michai said.

After the amended law is enforced, a fund may be set up to buy wildlife of non-Thai species and return them to their native countries, he said.

No protected wildlife were on sale at the weekend market during the Prime Minister's visit.

300 Animals Seized at Chatuchak Market After Anan Visit

BK0804013791 Bangkok THE NATION in English 8 Apr 91 p A1

[Text] Authorities seized more than 300 wild animals at the popular Chatuchak weekend market yesterday, just one day after Prime Minister Anan Panyarachun paid a surprise visit there and reiterated his pledge to clean up Thailand's image as one of the worst countries for illegal trade in wildlife.

On Thursday, Anand made a priority statement that the illegal trade in wildlife from both Thailand and other countries would be eradicated in accordance with the Convention on International Trade in Endangered Species, to which Thailand is a signatory. Yesterday's raid was the first major crackdown.

The raid on the weekend market's animal trading section in which the animals were seized was carried out by Forestry Department officials and Bangkok Metropolitan Administration [BMA] police.

The wildlife seized by the officials included baby gibbons, wild cats, lorises and several kinds of birds.

The owners, who were not arrested when the animals and birds were seized, face a maximum jail term of six months or a fine of Bt10,000.

The crackdown took place less than a week after the British-based Worldwide Fund for Nature condemned Thailand as one of the world's worst havens for wildlife smugglers. The organization called on British tourists to "boycott" Thailand to protest against Bangkok's lack of effective measures to stop wildlife trading.

Praphip Khuasakun, a BMA police chief based at the Chatuchak market, said wildlife traders have operated in a more cautious manner since it was reported that the government was planning to get tough with them.

A favourite selling tactic is for them to carry an animal around the market and approach a potential buyer, Prathip said.

"The law doesn't allow us to arrest a person carrying an animal, as he or she can claim that it is his or her own pet."

Endangered Species Available at Bangkok Markets

BK1204021891 Hong Kong AFP in English 0158 GMT 12 Apr 91

[By Anchali Worachet]

[Text] Bangkok, April 12 (AFP)—A woman selling rabbits at a weekend market here was cautious when approached by a customer who said she wanted to buy slow lorises and gibbons, which are protected species in Thailand.

"Don't you know it is illegal to sell such animals," she said with a stern look on her face.

But when the customer insisted, saying she wanted to buy the animals as birthday gifts for friends and was prepared to pay a good price, the trader relaxed and smiled.

"All right. We do have some slow lorises available. But they are expensive," she whispered.

She led the way to a less conspicuous place where the animals, priced at 2,500 baht (100 dollars) each, were hidden in small cloth sacks.

"We also have gibbons and even tigers if you want, but you must give us an advance order and we can deliver them to your home," she said.

Following a promise earlier this week by the military-appointed government of Prime Minister Anan Panyarachun to push a tough wildlife protection law through parliament, Thailand's previously blatant wildlife trade is starting to go underground.

Officials, pointing to sales of eagles, pangolins, deers, leopards and peacocks coming across the Cambodian border into Thailand, speak of "clandestine channels" through which endangered species are available.

During a recent visit to an illegal warehouse in a Bangkok suburb, buyers were seen picking over stuffed zebra heads, fox pelts, clouded leopard skins, bear gall-bladders and tiger penises.

Most of the rare items were imported from neighbouring Burma, Cambodia and Laos to be sold locally or re-exported, traders at the warehouse said.

Imported pelts of rare mountain goats, stuffed crocodiles and buffalo horns can easily be found at the weekend market, Bangkok's main bargain-hunting haven.

Police say they are powerless to act because the animals are not indigenous.

Some of these exotic animals find their way to restaurants patronized by wildlife gourmets willing to pay as much as 8,000 baht (320 dollars) for a bowl of braised bear paw soup.

The owner of one such restaurant said that his customers regarded wildlife cuisine as an elite delicacy with medicinal and other properties.

Those who eat tiger's penises believe they will gain the libido of the tiger, he said.

Thailand has been condemned twice in the last two years for its alleged failure to curb illegal wildlife trading and trafficking.

In 1989, the Swiss-based World Wildlife Fund and Worldwide Fund for Nature listed Thailand among four countries doing "the least to prevent massive trading in rare wildlife species."

This year, the British branch of the fund issued a statement accusing Thailand of being "probably the world's worst" wildlife-trading haven.

Forestry Department Chief Phairot Suwannakon blamed the rampant illegal trade on obsolete laws that do not ban the shipping of endangered species from countries that are not signatories to the Convention on International Trade in Endangered Species (CITES)—including Burma, Cambodia and Laos.

Last year, forestry officials rescued six baby orangutans and two gibbons that were about to be put on a flight for Yugoslavia in small crates.

But no one was arrested as the rescue was made on grounds that the animals' health was threatened. The orangutans were treated for pneumonia and parasites before being returned to their native Indonesia.

Another constraint in curbing the trade is a loophole in existing legislation which allows private individuals to possess two animals belonging to a protected species.

While this proviso will remain in the new government-proposed law, jail sentences and fines are to be increased for illegal trading.

But observers said it was not expected to put an end to the lucrative trade.

"Poaching knows no boundaries," one wildlife activist said, adding that he had seen reports of dealers smuggling animals out of Thailand and then shipping them back as foreign merchandise.

VIETNAM

Over 10,000 Cases of Forest Destruction in Thuan Hai Province

91WN0348A Hanoi NHAN DAN in Vietnamese
2 Mar 91 pp 1, 4

[Article by Ba Muoi: "Thuan Hai Province: Over 10,000 Cases of Forest Destruction—Forest Destroyers, Murderers To Be Severely Punished"]

[Text] In four districts in southern Thuan Hai Province, in 1990 there were more than 10,000 cases of forest destruction. 3,000 hectares of forests where trees had been felled, and tens of thousands of cubic meters of timber being taken by traders. Forest destroyers were assisted by all sorts of people and all kinds of means. For instance, at the Suoi Kiet railroad station, on 30 November 1990 the stationmaster on duty let precious timber be loaded into car No. 1131596 for being carried away. In a busy location involved in forest destruction in Tanh Linh District, hundreds of timber traders everyday rode their motorcycles around to get in touch with the "knife and hammer" gangs, to give them orders to cut down trees in the forest, and to organize the transporting of timber to a staging area. These traders lived in the homes of village cadres. The forest destroyers operating in an area on the boundary between Dong Nai and Thuan Hai Provinces usually worked in groups of 30-50 people, were armed when they got into the forest, and fiercely fought with guns and knives against the forest-protecting forces.

I was working with the Tanh Linh District deputy chairman in charge of agriculture and forestry when a subdivision forest ranger came in to make a report: "Dan, a forest protection ranger of the Song Cat state forest, during a mop-up operation aimed at forest destroyers, was beaten by the latter." The hot spot where forest destruction and seizure of precious timber took place was an area in the Thuan Hai 2 and Suoi Gieng state forests. On 23 December 1990, about 50 forest destroyers from Xuan Hoa Village went into the forest to fell trees, which they loaded onto an ox cart. They were caught by the forest protection unit of Suoi Gieng state forest, which made a violation report and ordered them to bring the timber to the state forest headquarters. On the way there, they tried to resist the order, fought back, and killed two members of the unit, Le Van Be and Vo Hong Trang. They also fought and chased away other unit members. At the Gia Huynh subdivision, the forest protection team headed by Nguyen Van Thu encountered a group of people using 30 bicycles to carry timber

from the forest. As they saw that there were only three people in the team, the group launched an attack against them and fled with the timber. Nguyen Chuong, director of the Gia Huynh Hamlet cooperative, and Duong Thanh Son, leader of the local militia unit, said that serious destruction of the forest in this area was committed by people who came from four villages on the Dong Nai Province side. They resorted to many tricks, including finding out about "internal situation," and promptly entered the forest with their ox carts whenever the forest protection forces showed any sign of relaxing the control efforts. That was the reason why farmer households had been refusing being assigned forest sections to care for, a task they were afraid that they could not fulfill. In June 1990, 60 forest bandits led by a one-legged war veteran and riding a large vehicle entered the Song Dinh subdivision to cause disorder by beating and injuring many workers, destroying a DT75 vehicle, smashing the top of a power plow, and seizing a gun. Thang, the driver of the DT75 vehicle, fought back, retook the gun that had been seized, and shot at the attackers injuring two of them, who then fled. Many drivers, including drivers of army vehicles, always tried to fight the forest protection forces in order to escape when they were confronted by the latter while illegally transporting timber.

The question is no longer that of poor people trying to earn a living. With the scale of their well-organized and deliberate acts of violence, they are forest bandits and must be brought to the law as any other gangs. The only difference here is the fact that forest bandits not only commit murders but also destroy the environment and cause bad effects on social life in a large area.

Realities show that if we do not resolutely punish forest bandits, they will continue to kill people and to destroy our natural resources. If the forest-protecting forces cannot protect themselves, we cannot see how they can fulfill their task.

In the case forest protection unit members are forced to use weapons to deal with these bandits and unintentionally injure or kill some of them, they may be put in jail. The forest-protecting forces are in a serious dilemma.

In order to save the forests, our country's precious resources, in addition to such measures as propaganda and education, we suggest that the law enforcement organs of Thuan Hai Province urgently examine the cases of those people who have destroyed forests and killed forest-protecting cadres and civil servants, try them early, ensure the seriousness and fairness of the law, and prevent the illegal seizure of socialist resources.

REGIONAL AFFAIRS

CSFR Denies Hungarian Press Agency's Claims Regarding Gabcikovo

AU0504151391 Prague CTK in English 1439 GMT
3 Apr 91

[Text] Bratislava April 3 (CTK)—The Czechoslovak side has denied a report by the Hungarian news agency MTI that Czechoslovakia has started building a project connected with the Gabcikovo Hydroelectric Power Plant on the Danube.

The Hungarian Agency claimed the Czechoslovak investor has begun construction of the "C" project, conceived as a temporary alternative solution if the Hungarian side fails to carry out its contractual obligations arising from a respective treaty concluded between the two countries.

A senior representative of the Czechoslovak investor has told CTK that the "C" alternative is prepared and the investor is awaiting the final decision of the Slovak Government.

Jozef Oblozinsky, first deputy director of the Water Conservancy Works in Bratislava, said that the Czechoslovak side has so far done nothing which would run counter to the treaty.

Oblozinsky added that though less economic than if it were constructed together with the Hungarian side (i.e. the original Gabcikovo-Nagymaros project) the Gabcikovo water works must be completed to compensate for the expenses worth about 15,000 million Czechoslovak korunas.

The Czechoslovak-Hungarian treaty on the construction and operation of the Gabcikovo-Nagymaros Hydroelectric Power Plant on the Danube was signed on September 16, 1977 and the construction started in 1978. In August 1989 the Hungarian side announced its decision to halt work on the project, including the Gabcikovo plant built on the Czechoslovak territory, thus interrupting the agreed timetable for construction. Talks held by the two sides ever since have so far not produced any solution.

Dispute Over Experts' Report on Ruse-Giurgiu Pollution

AU0404082791 Sofia BTA in English 2050 GMT
3 Apr 91

[Text] Sofia, April 3 (BTA)—The results of the international expertise [i.e. study] on the environmental pollution in the region of the cities of Giurgiu (Romania) and Ruse (Bulgaria) with the participation of experts of the United Nations Environmental Protection Programme (UNEP) gave rise to heated discussions at a press conference held here today at the Ministry of Environment. (The Ruse-Giurgiu problem was brought about by the many-year pollution of the city of Ruse by the chemical

works in Giurgiu.) However, the former leaders of the two countries Todor Zhivkov and Nicolae Ceausescu, did not let this problem "spoil" their good relations. This prompted the first demonstrations and later the setting up of the first non-formal organization in Bulgaria during Zhivkov's regime. The taboo on this problem was raised in 1990 after Todor Zhivkov was removed from power. There followed negotiations at government level, the exchange of declarations between the parliaments of the two countries and an agreement between the two foreign ministries on holding this international expertise [study]. (It was held from November 26 through 30.)

The results of the expertise [study] were presented at the press conference which was also attended by representatives of independent ecological movements. According to these results, from the geographical and meteorological point of view, the region can be regarded as a single ecological zone. The present pollution is a problem caused by pollutants on both sides of the Danube which should be solved by means of a joint programme and good coordination.

Journalists and specialists objected to the conclusions of the experts. They were particularly dissatisfied with the ascribed equal guilt for the pollution of the region. The Ministry of Environment was accused of concealing data in the past. According to Bulgarian specialists, some of whom took part in the expertise [study], measurements were taken only in two of the workshops in Giurgiu, and at a time when they were not working at that.

An opinion was expressed that the lack of an overall picture on the real ecological situation in Ruse was the reason why the experts reached the conclusion that: The problem does not seem acute, pressing and demanding urgent measures. Its impact on the health of the population and on environment probably does not differ from that in the other industrialized regions of similar geographic and meteorological conditions in the world.

It became clear that the international experts were acquainted with the state of health of the citizens of Ruse and especially of the children living in it. In the course of five years the cases of children with congenital deformities increased from 27.5 to 39.7 per thousand.

The stand taken by the expert group of the ministry after it was acquainted with the results of the expertise [study] is presented in a separate paragraph. It says that the "available data on the state of health of the population in Ruse proves a specific 'pollution- effect' connection. The existing health risk should be regarded as an urgent problem demanding immediate action." On the whole the expert group agrees with the proposals and the conclusions of UNEP.

Mr. Valentin Bosevski, deputy minister of environment, tried to calm the audience, stressing that this expertise [study] should be regarded as a stage in the solving of the environmental problems of the region. In this Bulgaria will receive assistance within the PHARE [economic

reconstruction aid for Poland and Hungary] Programme and from other foreign organizations and institutes.

Bulgarian, Romanian Environment Ministers Meet

AU1204070891 Sofia BTA in English 2043 GMT
11 Apr 91

[Text] Ruse, April 11 (BTA)—Experts of the Ministries of Environment of Bulgaria and Romania met here today to discuss the observance of UNEP [United Nations Environment Program] recommendations concerning the environment in the region of Ruse. Environmental parties and movements from Ruse and Giurgiu also took part in the meeting. UNEP experts conducted tests of environmental pollution and industrial safety in the region of Ruse last November.

The Bulgarian and the Romanian side confirmed that they accept the conclusions of the international expert mission and have no differences over it. They specified the number and rank of the members of the Joint Coordinating Committee for Control and Assessment of Health Care and the Environment in Ruse and Giurgiu. The committee will be set up at the next Bulgarian-Romanian meeting next Thursday in Bucharest and the countries will be represented by twenty members each: chemists, physicians, ecologists, lawyers and representatives of the local authorities, the government and the general public. It was decided that the two sides will draw up a joint program to make industrial and public utilities enterprises environment-friendly and to reduce pollution in the area.

BULGARIA

Protest Against Belene Nuclear Plant Construction

AU2603221291 Sofia Domestic Service in Bulgarian 2000 GMT 26 Mar 91

[Text] Reports about the shipment of a nuclear reactor, now situated in the port of Bratislava and intended for the nuclear power plant in Belene, caused feelings to run high in Svishtov today.

The Public Committee for Ecological and Economic Protection of the Svishtov Region held a special session to discuss the issue. After several hours of discussion, the committee adopted a protest declaration addressed to the Presidency and the Council of Ministers. The public committee announces the town's readiness to strike and declares its intention to acquaint the governments of the neighboring Balkan states with all the arguments against building a nuclear power plant near Belene. The document points out that all means will be used to prevent this construction.

CZECHOSLOVAKIA

IAEA Team Inspects Nuclear Power Plant in Slovakia

LD0804134291 Prague CTK in English 1032 GMT
8 Apr 91

[Text] Bratislava April 8 (CTK)—An eighteen-member team of the Vienna-based International Atomic Energy Agency (IAEA) began their work today at a power station at Jaslovske Bohunice to inspect the safety of the V-1 section of the plant consisting of two Soviet-made power units which have been in operation since 1979. Austria has been demanding an immediate shut-down of the plant in southwest Slovakia, some 60 kilometres from the Austrian border, saying it is not sufficiently safe.

The IAEA Design and Operation Safety Review Team (DOSART), which is to conduct inspections on the two 440-megawatt units for three weeks, is formed by experts from France, Germany, Britain, USA, Japan, Finland, Spain, Switzerland, IAEA staff and a Soviet observer. The DOSART inspection will be the eighth at Jaslovske Bohunice. The plant produces six million megawatt hours of electric power annually, or 28 percent of the output in Slovakia.

The Czechoslovak Government has decided on the basis of findings made by local and foreign inspection teams to carry on with the production until 1995 if some 80 adjustments are made to increase safety. If production at the V-1 section were to go on beyond that date, a major modernization would be required.

General manager of the plant Juraj Kmoseňa told CTK today that for the first time the DOSART team will also study the general design of the power station.

POLAND

Foreign Debt Converted to Ecology Protection Fund

4U0604203591 Warsaw ZYCIE WARSZAWY in Polish 2 Apr 91 pp 1-2

[Krzysztof Walczak report: "Debt Converted To Save the Environment"]

[Text] President Bush's decision to write-off 70 percent of Poland's debt—part of which is to be transferred to a special environment protection fund—signals the first significant implementation of ecology protection in Europe. By so doing the Americans have shown their approval of the Polish Government's memorandum proposing that part of the written-off debt be allocated for environmental protection purposes.

If the United States Congress supports President Bush, approximately 10 percent of the \$2.6 billion debt will go

to a trust fund whose aims are to finance various environmental protection programs of international significance in Poland.

The Americans are no longer demanding the repayment of this money and are expecting Poland to pay it into the trust fund. Either way, the money has to be accounted for in the state budget (it appears in the foreign debt servicing account), with the difference that it will now be spent in Poland.

The Americans have thus gone further than the Paris Club in their support for the Polish Government's memorandum proposing the conversion of part of the Polish foreign debt into a fund for ecology protection. The memorandum, signed by Maciej Nowicki, minister for environmental protection, natural resources, and forestry, was sent to Poland's creditor nations at the beginning of March 1991. The memorandum emphasized that Poland would not be in a position to solve many of its ecology problems which "are causing concern in Europe and the world." To do so, Poland would require a minimum of \$1 billion annually. It therefore proposes to transfer this money from the foreign debt servicing account and create an ecology trust fund. Expenditure from the fund would be controlled by an international council and the principles on which finance for ecological protection programs—projects that would have an impact on the whole geographical region and not just Poland—would be worked out on the basis of a multi-lateral agreement with creditors.

Minister Nowak's memorandum—expressing the Polish Government's thinking—says that Poland is now institutionally ready to embark on environmental protection programs of international significance in 1991.

In practice, this signals a change in the former cautious attitudes of the Ministry of Finance and the Fund for the Servicing of the Foreign Debt. They had expressed fears that the conversion of the debt into an ecology fund could be a factor fueling inflation. Every dollar that is to go to ecology protection, namely, transferred to the ecology trust fund expressed in zloty's, means that Poland must put its own money into the fund. The plan also accepts that creditors will have a say in fund issues

and agrees to accept their conditions. In the memorandum, the minister outlines the general proposal for Polish action to protect its ecology maintains that the Polish economy is now able to transfer \$1 billion annually from the foreign debt servicing fund to the ecology fund and used for the protection of the environment in four main areas, namely: Lowering the trans-national pollution carried by air; limiting the pollution flowing into the Baltic; lowering the emission of gasses responsible for the so-called "greenhouse effect" and the dangerous levels of global warming; and supporting development programs in regions of rare ecosystems and of European significance.

The memorandum points out that Poland has 60 electricity generating power plants that significantly contribute to Europe's total sulfur dioxide and nitrous oxide [as received] emission levels. Poland needs technology in this area in order to lower these emission levels, but this technology has to be imported and is expensive. The memorandum also states that 10 voivodships in northern, central, and eastern Poland have some of the most outstanding natural ecological habitats in Europe (the Mazury Lakes, the Biebrzanski Marshes, and national parks).

The international council that is to control the fund is not exclusively bound by the four categories of environmental protection projects that have been suggested by Poland in the memorandum.

The official support that Poland has received from President Bush gives one hope that the Polish memorandum will receive a favorable response from the Paris Club members as well as other creditors. Particularly as almost no other country that has a comparable debt burden is also faced by such enormous ecological problems. In a recent document circulated to Sejm deputies, the Ministry of Foreign Affairs says that the particularly serious ecological situation in Poland many incline its creditors to make a special concession and that says that no other debtor country will be able to count on similar concessions."

The Foreign Ministry document entitled "Current Ecological Tasks of Foreign Policy," states that Professor Jeffrey Sachs is one of the authors of the concept of writing-off the Polish debt and creating a special ecology protection fund.

LATIN AMERICA

BRAZIL

Foreign Minister Cites Environment Protection During UK Visit

PY0604183891 Brasilia Radio Nacional da Amazonia Network in Portuguese 1000 GMT 6 Apr 91

[Text] Foreign Minister Francisco Rezek has stated in London that Brazil's image abroad is no longer the negative image of past years. Minister Rezek made this statement after a meeting with British Foreign Minister [title as heard] (Tristan Geld Jones) at the end of his second day in the United Kingdom.

Minister Rezek said the world's attention, especially Europe's attention, is focused on the international conference on the environment to be held in Rio de Janeiro next year. The Brazilian foreign minister noted that preservation of the environment in developing countries should be promoted along with the solution to social problems.

[Begin Rezek recording] An attempt is being made to speed up development to solve the social crisis, the very serious social problem that countries such as ours face to a greater or lesser degree, without neglecting the problem of pollution and the loss of certain ecological wealth that cannot be recovered once it is lost. [end recording]

Minister Rezek mentioned the Amazon as a good example of an ecological sanctuary that must be preserved.

[Begin Rezek recording] As for the Amazon, more than a theory, it has been scientifically proven that whatever is lost there cannot be recovered. The Amazon is very rich from a biological point of view and this wealth cannot be recovered once lost.

Therefore, the need to preserve this balance inspires Brazil, and it should be recalled that the reason for this is that countries such as ours have a duty to promote this balance. [end recording]

Minister Rezek suggested that international financial institutions should grant less developed countries, such as Brazil, preferential treatment in financing ecological programs.

Pace of Amazon Region Deforestation Declining**INPE Survey Results**

91WN0323Y Sao Paulo O ESTADO DE SAO PAULO in Portuguese 7 Mar 91 p 12

[Text] The deforestation of Amazonia is slowing down, according to the figures in the latest survey by the

National Institute of Space Research (INPE) as released yesterday: 13,818 square km of forest were cleared between August 1989 and August 1990. In absolute terms, the area in question is still large—the equivalent of half the the State of Alagoas—but even so, that is 36 percent less than the deforestation recorded over the previous decade (between 1978 and 1988), when the average area was on the order of 21,135 or 21,500 square km per year, including areas cleared for the construction of hydroelectric plants.

According to INPE's Director General Marcio Nogueira Barbosa, the repetitive nature of the surveys, which are based on images produced by the U.S. Landsat satellite in 1978, 1987-1988, 1989, and 1990, now makes it possible to produce a table showing how deforestation has progressed. And in that table, the gradual deceleration of deforestation is starting to be visible.

The state with the most deforestation in absolute terms is Para (4,902 square kilometers), followed closely by Mato Grosso with 4,026 square kilometers. This is an indication that big ranches—especially cattle ranches—are continuing to advance on the forest, although at a slower rate than in previous years, when the rate of deforestation in Para reached 7,000 square kilometers per year. With 35.9 percent of its area deforested, Maranhao continues to be the most devastated state. And Rondonia, where 1,676 square kilometers were cleared last year, is still in second place, with 13.9 percent of that state's area having been altered.

The most disturbing change is that in the State of Amapa. Although practically intact so far, with only 0.9 percent of its territory deforested, Amapa was the only state to show a rising rate of deforestation. The rate of clearing in Amapa between 1978 and 1988 totaled 73 square kilometers per year. Between 1988 and 1989, that rate rose to 139 square kilometers, and last year it jumped to 262 square kilometers.

Including this latest report on deforestation, the total forest area altered by man in Brazil's legal Amazonia comes to 415,251 square kilometers. That amounts to 8.5 percent of Amazonian territory. The INPE's study divides the total into three types of alteration. Very old deforestation adds up to 97,643 square kilometers. Recent deforestation to make room for ranches, settlement projects, mining companies, and cities accounts for 312,781 square kilometers. And areas inundated by hydroelectric plants cover 4,827 square kilometers.

Annual Deforestation of Amazonia

State	1978-79	1987-88-89	1989-90
Acre	632	553	558
Amapa	73	139	262
Amazonas	1,516	1,191	533
Maranhao	2,455	1,432	1,112
Mato Grosso	5,152	5,973	4,026
Para	7,000	5,762	4,902
Rondonia	2,347	1,441	1,676
Roraima	303	636	161
Tocantins	1,657	744	588
Legal Amazonia	21,135	17,871	13,818

The latest survey carried out by the INPE shows that the rate of devastation in terms of square kilometers per year has declined but is still disturbing.

Source: INPE (National Institute of Space Research)

Monitoring

This year the altered area was calculated by a completely automatic process using digitizing boards, and that should have the effect of reducing the margin of error from 10 to 5 percent. The figures and an atlas containing those maps have been supplied to IBAMA (Brazilian Institute for the Environment and Renewable Natural Resources) and are to be used for the next forest burning season in June. "The INPE is also producing deforestation maps by municipality to make the task of monitoring even easier," says Marcio Barbosa. Those maps should be ready by August of this year.

The new figures are also being sent to international organizations such as the World Resources Institute, the World Bank, the United Nations, and so on, which have been saying that Brazil's Amazon region is being deforested at an annual rate of from 40,000 to 80,000 square kilometers. Those institutes are to correct their reports on the basis of the INPE's surveys.

Goldemberg Comments

91WN0323Z Rio de Janeiro *O GLOBO* in Portuguese
7 Mar 91 p 22

[Text] Brasilia—The deforestation of Amazonia in 1990 declined by 27 percent in terms of the year before, according to an announcement yesterday by Jose Goldemberg, the secretary of state for science and technology. His calculations indicate that if the government is able to continue that rate of decline, destruction of the forest six years from now will total only 3.5 square km per year—the equivalent of half the area of Greater Rio de Janeiro.

Goldemberg said the decline was due to the ending of subsidies for large agricultural projects and to monitoring by IBAMA [Brazilian Institute for the Environment and Renewable Natural Resources]. In his opinion, that result gets Brazil off the hook as far as the international community is concerned and may enable it to obtain new loans.

The exact figures obtained by the INPE (with a margin of error of less than 5 percent) are seen as a Brazilian weapon in international negotiations. According to Goldemberg, the lack of surveys covering the deforested area led to international conjecture. In 1988, the World Bank even said that at the rate at which devastation was proceeding, Amazonia would disappear within a few years. According to the INPE's data, 90 percent of Amazonia is still intact.

Armed with that information, the Brazilian Government will be able to say that the burning of Amazon forests contributes less than 4 percent to the greenhouse effect. The total deforested area comes to 415,251 square kilometers, which is equivalent to the area of France.

Lumber Companies Fined; Wood, Skins Seized

PY0204154091 Brasilia Domestic Service in Portuguese
2200 GMT 1 Apr 91

[Text] The Rio Grande do Sul Forest Rangers have fined eight sawmills a total of one million cruzeiros. These sawmills have been felling trees in the natural forest of the (Anoni) cattle ranch in Sarandi and Ronda Alta districts.

According to (Adoni Ecker), the president of the Municipal Association of Environment Protection, forests once covered 70 percent of this region, but that figure has been reduced to just three percent.

After a 10-day control on roads and lumber companies, the IBAMA [Brazilian Institute for Environmental Affairs and Renewable Natural Resources] has decided to close down and apply fines totalling 24 million cruzeiro to 80 lumber companies in 25 districts in southern Bahia State in the Atlantic Forest area.

One thousand cubic meters of copaiba [jatoba] wood, cherry wood, [name indistinct], and other fine woods, equivalent to about 900 logs, have been seized.

Birds like canaries, parakeets, and thrushes, as well as turtle shells and alligator skins have also been seized.

BRITISH VIRGIN ISLANDS

Oil Spill Clean-Up Nearing Completion

FL1104222591 Bridgetown CANA in English
2038 GMT 11 Apr 91

[Text] Road Town, Tortola, April 11, CANA—The clean-up of tar balls that appeared on British Virgin Islands [BVI] beaches after an oil barge sank will be completed within another week, the BVI Government Information Services reported. Clean-up efforts began April 2. The barge sank off St. Kitts on March 6 and oil from it washed up on beaches in St. Kitts and Nevis, St. Maarten, St. Barths, Saba, St. Eustatius, the U.S. Virgin Islands, Puerto Rico, and the BVI.

Tourist board director Russell Harrigan said tourists and travel agents especially have been expressing concern about the effects of the spill and have been reassured that the impact on BVI beaches and marine life has been minimal. "The damage to most of the areas was very minimal and I'm placing my estimate of the cost of clean-up at approximately 5,000 dollars (U.S.)" said Department of Conservation and Fisheries biologist Julie Overing.

The island most affected by the tar balls was Cooper Island. Peter Island, Norman Island, Virgin Gorda, Beef Island, and Great Camanoe were also affected but Tortola's beaches and the popular beaches or anchorages on Virgin Gorda were not damaged.

The Conservation and Fisheries Department, with the aid of the ports authority and specially-hired workers, has been carrying out the clean-up of the tar balls, first noticed on March 22.

DOMINICAN REPUBLIC

Reforestation Only Remedy for Desertification

91WN0329A Santo Domingo LISTIN DIARIO
(DESARROLLO Magazine) in Spanish 22 Feb 91 p 4

[Article by Dr. Jose Miguel de Pena Jimenez]

[Text] The nation is currently undergoing a very interesting period of its existence.

We are living at a time of believers and nonbelievers.

It is difficult to determine the percentage for each group. What is important is that it has been found that they cannot co-exist.

There are groups attempting "to cover the sun with a finger," as the saying goes: trying to conceal a reality that is obvious to everyone.

The Dominican Republic could become a vast desert within a few years; vying (as some aspire) to become another Haiti.

The policy of repression has been selected (an unfortunate choice) to protect a virtually ridiculous portion of forests.

Let us look briefly at what the cold statistics say:

The nation has 160 million available tareas, 19 million of which consist of woods.

Of that grand total, the General Forest Directorate holds only 790,000 tareas: in other words, a mere 0.5 percent.

The rest are under the jurisdiction of the General Parks Directorate.

For lack of will, or perhaps of resources, the Forest Directorate has done insufficient planting.

During the past 12 years only 189,000 tareas have been planted: that is, an average of 15,000 tareas per annum.

And what does this represent? Only 10 percent of the planting that should have been done.

Let us return to the numbers.

As the experts have determined, the Dominican Republic needs to plant 200,000 tareas [one tarea equals approximately 25 acres] per year, or the equivalent of 30 million trees annually.

This is a rather easy calculation, because we have found that 157 trees can be planted on each tarea.

Every tarea costs a total of 1,384.74 pesos per five-year period; which means that 276,984,000 pesos must be invested annually.

If we calculate that it takes a five-year period for every tree to reach maturity, then we shall see that each tree will cost 9,213 pesos to mature and become usable.

The current budget of the General Forest Directorate for planting is too small. This means that we cannot even hope that the future will be relatively manageable.

Precluding the possibility that the General Forest Directorate will be able to undertake this planting, only one solution would remain: the private sector.

Only in the hands of national investors, with backing from international agencies and incentives in keeping with the laws in effect, will it be possible to confront this challenge with real chances for success.

However, these plans must be channeled through a new agency, consisting entirely of experts in the field who are only thinking of the country's future, and who are able to accurately interpret the thinking of President Joaquin Balaguer in this regard.

The General Forest Directorate could be assigned, with repressive measures if you will, as it is now, to take care of the 790,000 tareas that it currently holds.

In this way, there would be a great national relief, and the waters (in this case the expression really fits) would return to their channels. They would be able to resume the course from which they were abruptly cut off at the very time that the entire nation had turned its gaze toward the woods, and to the real, actual possibilities of dealing with a chaotic situation.

President Balaguer himself has been the major fighter against the felling of trees. One need only recall that campaign for closing sawmills, which ended successfully with the virtually total stoppage of felling woods.

This massive planting of 200,000 tareas annually would serve not only to prolong the life of rivers and streams, that is, our rain sources, but also to reproduce the firewood and charcoal still being consumed by over 80 percent of the population.

But, besides, it would serve to replace wood imports, which currently amount to \$70 million per year, reaching the fabulous sum of a billion Dominican pesos reckoned at the current rate.

The policy is not clearly established by these numbers, which have been a result of patient investigation and, more than that, of a sincere desire, a patriotic one if you will. The policy, we reiterate, is that of supporting private enterprise.

The path, clear as the water that our ecologists demand, does not lie in repression, but rather in a sustained development, backed by the laws in effect, with their incentives, and in the hands of the private sector.

Deforestation, Desertification Studied

91WN0329B Santo Domingo *EL CARIBE*
(AGROPECUARIO Supplement) in Spanish 28 Feb 91
p 5

[Article by Telesforo Gonzalez, M.S.]

[Excerpts] The irrational use of natural resources in the Dominican Republic, overlooking the fact that they are an essential element for food production, human habitats, and the continuity of life in the animal and plant kingdom, is causing serious problems for both the present and future generations.

The disappearance of woods, the erosion of soils on slopes and mountains, as well as the extinction of many flora and fauna species, bode a gloomy future for all Dominicans. It is estimated that 86 percent of the national territory has been stripped of its plant cover. By

the year 2000, the Dominican Republic will be almost a desert if pertinent measures and action in this area are not taken now.

The problem of the deterioration of natural resources in the Dominican Republic does not lie solely in the destruction of trees, but also in that of the agricultural soil, which has been dragged by rainwater to rivers, and from there carried to the sea. This destructive process is even worse than the felling of a tree itself, considering the fact that an inch of soil requires centuries and millenia to be formed.

It is estimated that, during the past 30 years, 6.4 million tareas (400,000 hectares) have stopped producing food for human consumption as a result of deforestation and soil erosion.

This situation has contributed to the loss of a considerable percentage of mountain and slope soils. That is serious, because the agricultural potential of the soils has declined, and will continue to decline appreciably.

While our woods are disappearing, water levels are falling, and the fertile soil layers are being eroded by wind and water. The result is drought and national deforestation on a large scale. With the loss of our woods, animals are disappearing, harmful insects are multiplying, and many plant and animal species are becoming extinct.

It is estimated that, by the year 2000, the national population will demand 734,000 cubic meters of wood for industries, and 4.3 million cubic meters for firewood and charcoal. This means that, by that date, it will be necessary for 4,594,749 tareas (287,171 hectares) to be planted with trees in order to ensure the supply of such products.

Preserving the few woods remaining to us at the headwaters and on the banks of rivers and streams is imperative for the present and future generations. The ban on cutting trees in the vicinity of watersheds must be implemented strictly, without leniency. Watersheds requiring reforestation cover an area of 9.92 million tareas (620,000 hectares).

A considerable percentage of Dominicans is unaware that the water for human, agricultural, and industrial consumption originates essentially in the country's principal watersheds. These watersheds are being victimized by man's ax and machete. The annual water consumption on the part of the national population is estimated at 446 million cubic meters. By the year 1995, it is anticipated that the demand for water for industrial consumption will be 255 million cubic meters; and for human consumption, 690 million cubic meters. [passage omitted]

Total National Area in Tareas/Square Km		
Current Use	Approximate Area	Percentage
Agriculture, livestock raising	45,000,000 tareas (28,302 square km)	58.4
Wooded area	9,762,600 tareas (6,140 square km)	12.7
Unproductive untilled land	6,319,000 tareas (4,100 square km)	8.5
Lakes, marshes, cities, construction works	3,816,000 tareas (2,400 square km)	4.9
Fallow forests (regeneration)	11,925,000 tareas (7,500 square km)	15.5
Grand total	77,022,600 tareas (48,442 square km)	100 percent

Coffee Planting Contributes to Deforestation

91WN0329D Santo Domingo *LISTIN DIARIO*
in Spanish 26 Feb 91 p 7

[Article by Ricardo Santana]

[Text] Santiago—Three panelists who analyzed the coffee problems in the Dominican Republic recommended that producers not fell woods to plant caturra coffee. They claimed that this is contributing to deforestation.

Engineer Domingo Peralta from CENDA [Agricultural Development Center], Dr. Luis Olalla, and Henry Stenor, from the Pucamaima environmental group, analyzed the topic "Coffee, Reforestation or Deforestation?" during a panel discussion held in the Center's library.

In his remarks Peralta said that, in order to make room for coffee, many farmers are felling trees to prevent shade, and so that the plantations will not be stricken by blight.

Nevertheless, he noted that those farmers apparently do not realize that they are contributing to deforestation, and thereby diminishing rainfall, resulting in a decline in the volume of rivers and streams.

He claimed that planting coffee in full sunlight might solve the blight problem, because the disease appears on shaded plantations grown on land with excessive moisture and rainfall.

He indicated that planting coffee in full sunlight is not advisable, because of the costs and the deforestation.

Substitution of Fossil Fuels Only Remedy

91WN0329C Santo Domingo *EL SIGLO* in Spanish
5 Mar 91 p 5

[Editorial: "How To Make Our Forests Grow Again"]

[Excerpt] [Passage omitted] In the Dominican Republic, net domestic fuel consumption has retained the following characteristics: firewood and charcoal, 67 percent; liquid gas, 9.2 percent; kerosene, 2.7 percent; gas oil, 2.6 percent; and electricity, 19.2 percent. This information reveals the extraordinary weight carried by firewood and charcoal in the structure of net domestic fuel consumption in our country.

The situation for the Dominican Republic can also be characterized quantitatively. The total volume of annual

firewood and charcoal consumption at present amounts to 3.9 million cubic meters: equivalent to 0.5 cubic meters per inhabitant annually. According to the General Report on the Forest Plan in the Dominican Republic, in its preliminary version of November 1987, prepared by the FAO [Food and Agriculture Organization], the forests with a potential for wood production for fuel fluctuates between 200,000 and 300,000 hectares. However, their average wood output is so meager (about two cubic meters per annum) that, even if their entire area were put under forest management, it would not suffice to cover the projected annual consumption (over 4 million cubic meters annually during the next 25 years).

Thus, even with energy production plant programs, even with the incorporation of forest organization practices for exploiting dry woods, and even with the reforestation programs, the real possibility of stopping the destruction of our woods lies in the immediate, massive substitution of firewood and coal with petroleum by-products. This necessarily entails creating the conditions to enable the majority of Dominican families to be provided with a liquid gas or kerosene stove. It should not be forgotten that, in the city of Santo Domingo alone, there are about 300,000 families cooking with firewood and charcoal. The government must also ensure the security of the liquid gas and kerosene supply; something that does not exist at present.

The lesson that we can learn from the Cubans in the management of their wooded resources is that protecting them means changing the structure of the net domestic fuel consumption first, and that it will be impossible to discuss forest policy while 70 percent of the population depends on firewood and charcoal for cooking. It is not merely a matter of using harsh treatment; it is a problem involving plans and policy.

NICARAGUA

5,000 Central American Firefighters on Alert

PA1104193891 Managua Domestic Service in Spanish
1815 GMT 9 Apr 91

[Text] We have an up-date report from our correspondent in Esteli, [name indistinct] Ismael, on the coordination activities that were carried out yesterday and this morning with the other firemen's associations in Central America. Meanwhile, the Government Ministry has not

said one word during this emergency, but has sat back and relied totally on the firemen's confederation.

[Begin recording] [Ismael] According to Commander Abraham Enrique Castillo, head of the Nicaraguan Firemen's Confederation, 5,000 volunteer firemen from Central America are ready and waiting to come in and fight the fire on the Atlantic coast. A U.S. unit is also on stand-by waiting for emergency calls from Nicaragua. Honduras is on alert with five trucks with personnel and its equipment ready. Each truck has a 5,000-gallon water capacity. Also, the firemen from Guatemala, El Salvador, Costa Rica, and Panama are waiting for instructions to head for the Atlantic region where more than 45,000 hectares of land were razed by the fire. Castillo said that the liaison communications center with Central America and the United States has been set up here in Esteli, through ham radios, to immediately transmit the government's first call for help to the neighboring countries and to keep them informed on the developments of the disaster. Meanwhile, Castillo noted that in Region I there are 120 voluntary fire fighters on alert, ready to proceed to the Atlantic region.

Castillo also indicated that should the Central American and U.S. fire fighters come to Nicaragua, it is possible that they will have to travel by helicopter to the Atlantic coast as this is the only [effective] means of travel. We have here with us Commander Abraham Enrique Castillo, chief of the National Firemen's Confederation, who will give us a report on the support action which is currently being coordinated within Central America to fight the fire on the Atlantic coast.

[Begin Castillo recording] We reported the information to President Chamorro this morning. We want to give you an update on the information gathered by the Nicaraguan Firemen's Confederation, though. I talked to Commander Roberto Rodriguez Borja, the president of the Central American Firemen Associations, in Tegucigalpa and he told me that [words indistinct] to coordinate their help. He offered five trucks with a 4,000-gallon [as heard] capacity each, 50 forest firefighting specialists, and a 3,000 gallon tank. The Hondurans are overflying the area right now and in an hour they will give us more information.

Commander Walter Rolando Fuentes Gonzalez, president of the Nicaraguan Firemen's Confederation, also talked with the U.S. State Department and was told that the U.S. Embassy in Nicaragua has been given the necessary information to coordinate the aid that is to come from the World Firemen Confederation, headquartered in Huntington Beach, California. This organization can move all of its equipment to Nicaragua in less than 24 hours and this would help us extinguish this serious fire much more rapidly.

The fire has already destroyed 45,000 hectares and could destroy approximately 300,000 more. The fire will seriously impair the Central American ecology. Thus, we, the volunteer firemen, are coordinating all activities to fight it. Yesterday, we met in Managua to reschedule the 15 April Central American Firemen Congress to 25 May. The congress was suspended because we have a national and Central American emergency on our hands. Costa Rica, El Salvador, Guatemala, and Honduras have offered to help us. We have also coordinated activities with the U.S. firemen. They are the ones who can really help us as they have all the economic resources and equipment to do so. [end recording]

REGIONAL AFFAIRS

Japanese Computer Simulates Flow of Persian Gulf Oil Spill

OW3003040491 Tokyo KYODO in English 0323 GMT 30 Mar 91

[Text] Tokyo, March 30 KYODO—A private research organization commissioned by the Environment Agency has succeeded in simulating by supercomputer the flow of the Persian Gulf oil slick, so the agency can help Gulf countries control further pollution, officials said Saturday.

The officials said the computer simulation almost exactly duplicated the actual flow of the leaked crude oil observed by satellites and aircraft.

They said the flow of the slick can be forecast and the simulation could be used to help prevent further oil pollution outside the Gulf.

Some 1.5 million to 3 million barrels of oil were believed to have flown from oil shipping facilities off Kuwait around January 19 during the Gulf war.

The research organization will continue simulating the oil flow for one year ahead, the officials said.

UN To Help Sponsor Arab Environmental Protection Center

NC3103173891 Manama WAKH in English 1612 GMT 31 Mar 91

[Text] Manama, March 31 (GNA)—Egyptian State Minister for Cabinet Affairs and Administrative Development Dr. 'Atif 'Ubayd said that an Arab centre for environmental protection will be set up with the help and participation of the United Nations.

'Ubayd told the Bahraini daily 'AKHBAR AL-KHALIJ' that the Gulf states and Egypt will contribute financially and scientifically in supporting the centre to enable it to operate quickly so as to deal with the pollution problem.

A special unit will be set up by the centre to deal with environmental disasters as they occurred, he added.

He noted the next period will witness a boom, prosperity and strengthened relations between Egypt and the states in the region, after the previous phase proved that the destiny and the future are one and the integration is essential for the sake of stability and development.

On talks between Egypt and the International Monetary Fund, 'Ubayd said that IMF's mission is now in Egypt and draft agreement with Egypt is being prepared to be referred to the IMF's board of directors for approval.

BANGLADESH

Coastline Pollution Endangers Fish, Aquatic Species

BK0604144091 Dhaka Radio Bangladesh External Service in English 1230 GMT 6 Apr 91

[Text] In Bangladesh, fish and other aquatic species are reported to be on the verge of extinction in the Bay of Bengal along the Anwara-Mirersarai coastline of Chittagong because of environmental pollution. A study conducted by environment experts of the Department of Environment revealed that the sea along the coastline is highly polluted for various reasons, including indiscriminate discharge of oils, chemicals, bilge water, garbage, and other rejected substances mainly from ships and industrial units. Mangrove, forests, fish and other sea products are also threatened along the entire coastline of Bangladesh on account of unabated pollution.

INDIA

Environment Minister Views Pollution Control Plan

91WD05554 Calcutta THE TELEGRAPH in English 13 Feb 91 p 6

[Text] New Delhi, 12 Feb—Durgapur, Howrah and Digboi are among the 16 places in 14 states identified by the environment ministry as critical areas in its action plan for controlling pollution. Action would be taken in these places on a priority basis.

The action plan was discussed today by the environment minister, Ms. Maneka Gandhi, with her counterparts in the states and the chairman of the state pollution control boards.

The plan also identified heavy polluting industries and critical stretches requiring immediate attention along the Sabarmati, Subernarekha, Godavari and Krishna rivers and tributaries of the Indus, Ganga, Sutlej, Yamuna, Hindon, Chambal, Damodar Gomti and Kali.

The plan also lists proposals for common effluent treatment plants approved for financial assistance by the ministry of environment and forests. The total cost of these common plants would amount to Rs 127.52 crores.

The heavy air polluters include cement, thermal power plants, iron and steel, fertiliser industries, zinc smelters, copper smelters, aluminium smelters, and oil refineries. Measures for water pollution control are required in distilleries and fertiliser, pulp, paper, basic drugs, dyes and dye intermediates and pesticides plants. Oil refineries, petrochemicals, clusters of tanneries, sugar and pharmaceutical industries are also among the culprits.

At the meeting today, Ms. Gandhi said the rates and penalties for non-conforming industries would be increased through amendment of the Water (Prevention and Control of Pollution) Cess Act. Clean industries

would get rebates she said. The revenues thus raised would be spent to develop institutions like Pollution Control Boards and help states set up common effluent treatment plants. She urged the states, which had not ratified the Water (Prevention Control of Pollution) Amendment Act of 1988, to do so immediately.

She said rules under the Environment (Protection) Act had been amended, making it mandatory for the polluting industries to control pollution within a year of the notification of standards.

The Act also makes it mandatory for industries for which standards have already been notified, to meet them by December 1991. She urged strict implementation of the laws by the state pollution control boards.

Ms. Gandhi reiterated her plan to set up environment courts for speedy dispensation of compensation to the victims of environmental pollution. She said the Environment (Protection) Act of 1986 would also be amended to widen its scope.

Scheme for Labeling of 'Environment-Friendly' Products

91WD05544 New Delhi PATRIOT in English
20 Feb 91 p 8

[Text] The Environment Ministry has instituted a new scheme for the labelling of "environment friendly" products on the pattern of several developed countries, reports UNI.

According to official sources, the scheme would operate on a national basis and provide accreditation and labelling for household and other consumer products which meet certain environmental criteria along with quality requirements of the Indian standards for that product.

The "environment-friendly" label would be known as "ecomark" and would be of a design to be notified by the Central Government.

The sources said any product which was made, used or disposed of in a way that significantly reduced the harm it would otherwise cause to the environment could be considered as an environment friendly product.

The specific objective of the scheme, the sources said, was to provide an incentive for manufacturers and importers to reduce the adverse environmental impact of products. Also, to reward genuine initiatives by companies to reduce adverse environmental impact of their products and encourage citizens to purchase products which have a less harmful environmental impact. Ultimately, the aim of the scheme is to improve the quality of the environment and to encourage sustainable management of resources.

There will be three stages leading to the award of the "ecomark." First, a steering committee, set up in the Ministry of Environment will determine the product categories to be covered under the scheme.

The second stage involves identification of the specific product to be selected and individual criterion to be adopted by a technical committee of the Central Pollution Control Board.

Finally, the Bureau of Indian Standards (BIS) would assess and certify the products and draw up a contract with the manufacturers, allowing the use of the label, on payment of a fee.

The label shall be awarded for a minimum period of one year and shall roll forward annually. The BIS also has been vested with the powers to withdraw the licence at any time if they find any misleading information.

The environmental criteria for each product category will be notified by the Central Government and later on shall be translated into Indian standards by the BIS.

Production processes including the source of raw materials, energy conservation in the production, effect and extent of the waste generated from the production, disposal of the product and its containers, utilisation of waste and suitability for recycling or packaging would determine the primary criterion for a product to be considered environment-friendly.

Such schemes are already in force in the United States, Japan, Australia and a host of other European countries.

The sources said the whole idea was that if the products labelled environment friendly enjoyed an increased market share through the positive choices made by consumers it would prove an incentive for more companies to change their processes and products to meet the criterion and thus help check pollution and damage to the environment.

Introduction of such a scheme in India was of paramount importance because mere bans and government orders could not be the only instruments of market economy fundamentals in the country's ecological policy, they said.

Asked to elaborate on the concept, the sources said for instance soap, which contained phosphates and could pollute surface water was not an environment friendly product.

A car which polluted the air with thick exhaust fumes could also not be considered as environment friendly. Plastic products which are bio or photodegradable are definitely more environment friendly.

JORDAN

Water Shortage Threat Outlined

91AE0303B Amman AL-DUSTUR in Arabic
25 Feb 91 p 8

[Article by Malak al-Tall: "Farmers: 'Waste Water Destroying Our Crops'; Al-Bilbaysi: 'No Change in Purification Plants';" in This Section by and for People We

Attempt to Bring Citizen's Concerns to Official Attention for Benefit of Society."]

[Text] God endowed this country with rich farmland and the rain to water this land. Taking into consideration the government's ongoing efforts to provide an alternative to rainwater to irrigate crops throughout the seasons, how suitable is stored water for irrigating farmland without damaging it?

Hundreds, indeed thousands, of donums of farmland have been put at risk and ruined as a result of irrigating crops with treated waste water.

Farmers say that crops all the way from Wadi Shu'ayb to al-Shunah al-Janubiyah for a distance of 20 kilometers along the floodbed line have been ruined by this water. It also ruined crops irrigated by water from the al-Zarqa' floodbed, including the al-Rusayfah basins. Water from the al-Ramtha purification plant used for crop irrigation in the area surrounding the station has also made it impossible to use what those farmers were growing.

AL-DUSTUR passed on the complaint of those adversely affected by irrigating their crops with waste water to Dr. 'Abd-al-'Aziz Washshah, secretary general of the Jordan Valley Authority (JVA), who said: "The water irrigating crops in Wadi Shu'ayb is basically water from the al-Salt purification plant, plus water from some springs and seeps that run from Wadi Shu'ayb to the al-Shunah al-Janubiyah region, plus flood water which we try to store behind the Wadi Shu'ayb dam." He added that the al-Shunah al-Janubiyah region involves an entire basin growing bananas, citrus, and vegetables that is totally reliant on this water. When treated water is highly concentrated, it will sometimes contain elements that affect the soil, and therefore, the crops growing in it. Dr. al-Washshah added that this water has been irrigating crops for a long time. If it now contains something that is ruining crops, it will have to be analyzed and dealt with.

Regarding the al-Zarqa' floodbed, the JVA Secretary General said: "Prior to the recent rainstorms, waters behind the King Talal dam were highly saline due to water coming from the al-Khirbah al-Samra' plant and because the rainy season was late. Normally the al-Khirbah al-Samra' water is mixed with spring and flood water. But since the recent rainstorms the amount of water being stored has risen, and its quality has improved, especially in terms of salinity. Under present conditions this water will not affect the crops. It was in the past that such water ruined leaf crops. As for the area above the King Talal dam, that part is the responsibility of the Water Authority."

Waste Water

Engineer Mu'tazz al-Bilbaysi, secretary general of the Ministry of Water [Resources] and Irrigation, said that water coming from the purification plants, which is waste water, is used only for nonbeneficial agricultural purposes and is only consumed after being boiled. He

added that there has been no change in these plants that would ruin crops irrigated with the water they produce, and said: "We are prepared to conduct an on-site investigation, determine the causes of this irregular situation, and remedy it."

Regarding the al-Ramtha purification plant, Eng. Bilbaysi clarified that water from this plant is used by the Ministry solely to irrigate trees. He added that the Ministry in cooperation with the Cooperative Society rented land near the society and planted it with barley, [and said]: "The land was watered one time with purification-plant water, and thereafter we relied on the rain God blessed us with during this good season."

Purification Plants 100 Percent Improper

Falih al-Gharayibah, governor of al-Balqa', said: "Water coming off the purification plants does not contain any chemical elements, therefore it is not ruining the trees or crops it irrigates. Moreover, a cabinet decree bans vegetable farming in this region so that [such produce] will not be sold to the populace. You should know that farm owners wish we would allow them to use purification-plant water so they could irrigate their crops with it. How can they be complaining that their crops have been ruined by irrigating with this water?" Mr. al-Gharayibah says that the al-Salt purification plant, like all other such plants in the Kingdom, is 100 percent improper since the water flowing through it is unfit for irrigating small vegetables such as carrots, lettuce, radishes, potatoes, and the like. This is why a ban was imposed on the use of such water to irrigate these vegetables. Citrus trees are an exception because they are not affected.

The governor of al-Balqa' adds: "What applies to the al-Salt purification plant also applies to the al-Zarqa' floodbed, the al-Rusayfah basins, and the Kafranah purification plant. Moreover, we can not cancel the purification plants at a time when we are working with the government to allow us to use treated waste water in al-Shunah and Dayr 'Ala to irrigate crops. I need to point out that we banned vegetable irrigation with such water merely as a precaution because it is supposed to come from the purification plant fit for drinking, but considering the fact that it is not well purified, we banned irrigating crops with it."

PAKISTAN

Government Takes Concrete Steps To Protect Environment

BK0504105491 Islamabad Overseas Service in English 0800 GMT 5 Apr 91

[Text] The government has taken concrete steps to protect the environment from atmospheric pollution. These include promulgation of Pakistan Environmental Protection Ordinance 1983, setting up of environmental protection agencies at federal and provincial levels, and delegation of necessary powers to them to control the-

Cabinet Measures To Eliminate Chernobyl Consequences

LD0504173191 Moscow TASS International Service in Russian 0558 GMT 5 Apr 91

[Text] Moscow, 5 Apr (TASS)—Throughout the years that have elapsed since the accident at the Chernobyl Nuclear Electric Power Station [AES], the areas that suffered have remained the subject of the constant attention of parliament and the country's government. As was reported to a TASS correspondent at the USSR Cabinet of Ministers, over the last month a number of important new decisions have been adopted aimed at eliminating the consequences of the accident.

A concept has been approved by the government regarding the residence of the population in the areas that suffered as a result of the Chernobyl accident. It was drawn up by scientists from the USSR Academy of Sciences, the Academy of Sciences of the Ukrainian Soviet Socialist Republic [SSR], the Academy of Sciences of the Belorussian SSR, and scientists of Russia, and a decision has been adopted on putting it into force.

The decision adopted by the USSR Cabinet of Ministers in March "on additional measures to improve the material and social provision of medical and pharmaceutical staff to the health institutions located in the areas that have been subjected to radioactive contamination as a result of the Chernobyl AES" will give significant support to the public health bodies on the spot in building up medical cadres. A contract system of hiring staff and a whole number of benefits and advantages for working in areas of radioactive contamination are envisaged by the decision. Twenty million rubles per year have been allocated to finance the expenditure on this decision.

At the same time, with the rise in retail prices, the USSR Cabinet of Ministers had adopted a decision doubling the allowances allocated for acquiring "clean" food products in the areas in which a restriction has been introduced on the consumption of produce produced by local industry and from private subsidiary plots.

The USSR Cabinet of Ministers has drawn up and submitted for examination to the USSR Supreme Soviet a draft law "on the social protection of citizens who have been subjected to the effect of radiation as a result of the accident at the Chernobyl AES." Similar laws were recently adopted in Belorussia and in the Ukraine and a similar law is being drawn up in the Russian Soviet Federated Socialist Republic. The draft law is being discussed by the committee of the USSR Supreme Soviet and will be examined at a plenary session in the next few days.

Issues that were brought before USSR President Mikhail Gorbachev during his trip to Belorussia in March this year have been resolved.

Continuing the policy of developing international cooperation regarding Chernobyl issues, the USSR Government has started to work out of specific proposals to be

included in a program of such cooperation. It is being created with the participation of UN organizations and institutions in keeping with the resolution of the 45th session of the General Assembly of the world community adopted in December 1990.

Chernobyl Sarcophagus Future Under Discussion

LD0204133291 Moscow TASS in English 1243 GMT 2 Apr 91

[By TASS correspondent Aleksey Petrunya]

[Text] Kiev April 22 TASS—The sarcophagus entombing the fourth unit, which melted down during the accident at the Chernobyl Power Plant, is the key safety problem, according to Yuriy Samoylenko, general director of the Spetsatom Soviet agency, which ensures safety at the plant.

The sarcophagus is not fully sealed, Samoylenko told TASS. The total area of its unsealed surface is more than 1,400 square meters. In addition, there is a 2,000 tonne section of the reactor inside, hanging above the shaft. It was torn away by the explosion, he said.

The part has been dubbed the "lid". Many experts fear that its fall into the shaft could result in a discharge of the radioactive dust that has accumulated inside the reactor.

Scientists are discussing building a second cover for the unit, possibly made of titanium. Under another proposal the unit will be dismantled down to 12 meters, nuclear debris will be taken out and buried and the rest will be sealed with concrete.

Some specialists suggest dismantling the unit without building the second cover. The nuclear fuel and parts of the reactor would be removed.

"There should be ample financing of research and development to enable work on the most appropriate version of the future Chernobyl sarcophagus," Samoylenko said.

Replacement of Chernobyl Nuclear Plant Sarcophagus Projected

PM0904103991 Moscow KOMSOMOLSK4Y4
PRAVDA in Russian 5 Apr 91 p 1

[A. Korzun report: "Sarcophagus. Perestroyka"]

[Text] Should the sarcophagus over the Chernobyl Nuclear Electric Power Station's [AES] fourth power unit be destroyed? This apparently crazy idea was discussed the other day by the USSR Ministry of the Atomic Power Engineering and Industry's Science and Technology Council.

Yuriy Samoylenko, general director of the "Spetsatom" Robotics and Accident Repair Work Production Association (Prip'iat City), informed us that he and his colleagues proposed a project for demolishing the sarcophagus back in 1987. A scenario for the complete

destruction of the concrete covering within 10-15 years was presented at a session of the science and technology council.

"We start from the premise that the sarcophagus is only a temporary covering for the 'radioactive dirt,' and not the most reliable one at that," Samoylenko said on the telephone. "With the aid of advanced robotics and with a service personnel of some 300 people the damaged power unit can be cleansed from within in about 10 years. And the so-called fuel-containing substances (the products of decay and contamination) will be placed in containers and stored temporarily in a special sparger-basin under the unit. The sarcophagus is simultaneously dismantled, right to the foundations."

However, Samoylenko himself acknowledges that this project is extremely costly.

Yet Nikolay Babayev, academic secretary to the ministry's science and technology council, rates this idea as a "fantastic scenario": "We still do not know what the situation in the country will be in 10 year's time and at what stage the dismantling of the unit's concrete cover may be halted."

In the final analysis it has been decided to undertake the "monolithization" of the sarcophagus as early as this year—to seal it in concrete in accordance with a carefully conceived technology:

"The sarcophagus is unreliable; its walls are slowly disintegrating and cracks are appearing," Babayev explained. "But by monolithizing it we virtually totally exclude the possibility of radiation leaks."

This work will take several years, and the sarcophagus can remain in that state "at least a hundred years, and then, if need be, it can be broken up and destroyed."

Chernobyl Radioactive Burial Sites To Be Relocated

LD1004021591 Moscow TASS in English 1953 GMT 9 Apr 91

[By UKRINFORM-TASS correspondent Aleksey Petruniya]

[Text] Kiev April 9 TASS—The fifth anniversary of the Chernobyl Power Plant accident on April 26 will see the relocation of the radioactive waste burial [sites].

Directly after the blast hundreds of burials were built near the station and in the 30-kilometer zone to bury radiation emitting soil, machinery and equipment. The forests were razed and the soil ploughed.

However, the necessary technology was not strictly adhered to in building the burials and now the need has arisen to relocate the waste to more dependable burials.

So much radiation muck has accumulated in the 30-kilometer zone that it would take decades to remove it

all. It needs additional processing before removal. And this requires the building of a special processing enterprise. The Ukrainian Government has turned to some research and design institutes with the request to help design the enterprise.

Work is also underway to develop technology for restoring to use in the economy many materials after decontaminating them. For instance, a great deal of metal now lies idle in the zone, including 20,000 tonnes of stainless steel. The Swiss firm Recytec will supply equipment to decontaminate the metal.

The Belorussian Government has decided to set up a state expedition to rescue monuments of history and culture from districts affected by Chernobyl blast radiation.

According to First Deputy Culture Minister of Belorussia Vladimir Gilep, nearly 1,000 monuments of culture, including folk crafts, are located on contaminated territory in the Gomel, Mogilev and Brest regions.

"The expedition will take up the rescue of all these cultural valuables," Gilep told TASS.

This year expedition members are due to inspect abandoned palaces, cathedrals, and obelisks. They plan to restore and conserve the most valuable structures.

New Fertilizer for Chernobyl-Affected Areas

LD2803193491 Moscow Central Television Vostok Program and Orbita Networks in Russian 1530 GMT 28 Mar 91

[Video report by correspondent I. Dvorkin from the Khimprom Association in Dzhambul—from the "Vremya" newscast]

[Text] At the Khimprom Association in Dzhambul, the fertilizer shop has started turning out fertilizer capable of helping to render radioactive plants and soils harmless.

Here are the granules which, as it were, drive out radiation. This is a fertilizer made up of phosphorous and slowly soluble harmless compounds of calcium, potassium, and magnesium. Absorbing them the plants do not take up radioactive elements from the soil, which, alas, decay only with time. Even though the invention by Leningrad chemists of polifoska protects from the terrible effect only a particle of living nature, in this way it breaks the dangerous chain of the consequences of Chernobyl to which the earth, plants, animals, and people are tied.

In Dzhambul production waste is being used as raw material for these ecologically clean fertilizers, so that the chemical industry workers themselves also benefit. The new shop was built without a kopeck of state funds and yields some 30 tonnes of the salutary fertilizer. However polifoska may not reach Gomel or Vinnitsa at all. Today subsidies for agriculture have been abolished and the collective and state farms themselves are unable

to purchase the Dzhambul fertilizers which, in the conditions of the market, are becoming more expensive; leaving their prices unchanged would mean operating at a loss. In either case there will be no money to pay the wages and production will have to be halted.

[M.T. Atabayev, general director of the Khimprom Association—as captioned—interviewed in his office:] Foreign firms are now ready to give us credits and are also ready to resolve all our ecological problems: We can produce, they now say, acetic acid, methanol. This is output which is also very much needed and it can be made from our waste, without spending any resources. This is the comprehensive use of Karatau raw materials and, naturally, the income from this would clearly go to develop the industry. Many firms are expressing the wish to build a joint plant with us. But everything is being held up by three factors [as heard]: the fact that when I sell output, I am banned from having hard currency. [video shows bags of fertilizers, drawings of chemical processes involved in the fertilizer production shop, outside view of the works; phosphorous acid containers on railway belt lines]

Cossacks Protest at Rostov Nuclear Power Station Site

PM0804101991 Moscow KOMSOMOLSKAYA PRAVDA in Russian 3 Apr 91 p 4

[S. Sineok report: "Assault on Moscow. But for the Moment by Petition"]

[Text] Rostov Oblast—Uniformed cossack foot soldiers and cavalry completed a march from the city of Volgograd to the Rostov Nuclear Electric Power Station's walls. They did not take the power station by storm—on this occasion they limited themselves to convening a cossack circle right next to the administrative block.

The circle's participants considered the building of a nuclear electric power station on the Tsimlyansk Sea shore, in the midst of rich agricultural land, as a continuation of the genocidal policy against the Cossack people. Fears were voiced that if work on the power station begins, people will fear Don grain like the mutant vegetables from the Chernobyl zone.

The cossacks affectionately called the nuclear electric power station a "monster," and demanded that "the vile monstrosity be closed down." In the appeal, signed by 26 cossack circle atamans from the Don Army region, they declared their determination to "take more effective measures" in the event of the nuclear electric power station's construction being continued.

A cossack delegation (for the moment on foot and without swords) will be sent to the USSR Supreme Soviet.

Projected Tatar Nuclear Power Plant Converted to Organic Fuel

PM2403145591 Moscow IZVESTIYA in Russian 21 Mar 91 Union Edition p 3

[Alyans Sabirov report: "AES Converted"]

[Text] Kazan—The Tatar Nuclear Electric Power Station [AES] is being transferred from the nuclear department to the Ministry of Power and Electrification.

Last year people were laid off at the AES construction site. Its construction was halted by a mass environmental protest and an independent survey by prestigious specialists. The republic's parliament placed an official ban on continuing the work. The Union government gave its assent. By order of two ministers, measures have been outlined for converting the station. Electricity will be produced using organic fuel.

This construction epic, which has already consumed about 500 million rubles, has reached a conclusion. However, questions remain unanswered. How was financing illegally obtained for the work and plans for the startup of the nuclear power units outlined, even though the plan for the station had not been ratified? Huge losses will have to be written off. Who will be responsible for them? We would add that the "raw" project did not guarantee the necessary degree of safety. The actions of those who gave the go-ahead for construction should clearly be assessed by Prosecutor's Office organs.

Moscow Soviet Decides To Close Nuclear Reactors in City

PM2203170291 Moscow Central Television First Program Network in Russian 0600 GMT 20 Mar 91

[From the "Business Courier" program: Report over video on Moscow's nuclear reactors]

[Text] [Announcer] According to an INTERFAX report, the Moscow City Soviet Presidium has decided that the operation of nuclear reactors in the capital is inadvisable and that the construction of new nuclear reactors is impermissible.

According to this decision, based on the conclusions of an impact assessment commission, all nine nuclear reactors which are in operation in Moscow are to be shut down by July 1999.

The first to be shut down will be the reactor belonging to the Kurchatov Atomic Energy Institute.

Reactor owners must to agree a plan of measures with the Moscow City and Rayon Soviets to protect the population in the event of reactor accidents.

Geology Minister Gabrielyants Discusses Resources, Prospecting

LD0604205891 Moscow TASS in English 1422 GMT 6 Apr 91

[Text] Moscow April 6 TASS—"Should we retain a single economic space—and this is the will of the peoples in the Soviet Union—then we also need a single federal policy in establishing an all-union mineral and raw material basis," Soviet Geology Minister Grigoriy Gabrielyants believes.

In a TASS interview on the occasion of the traditional day of the geologist, marked in the Soviet Union tomorrow, he spoke about the problems of the country's geological service during transition to market relations and ways to resolve them.

"Information on mineral raw materials in the Earth's interior is the end product of the geologist's activity," Gabrielyants said. "Considering that geological information has no specific value now and was state property until recently (at present the mineral wealth has become the property of people who live on a given territory), it is easy to understand that market relations complicate the functioning of the geological service aided by the state budget."

"The allocation of funds is limited in the recent period, which leads to curtailment of geological prospecting and reduction in received information on minerals and their reserves."

"For geological science and the geological sector as a whole to develop successfully, we need a fund for the development of the mineral and raw material basis," the minister believes. "Such a fund should consist of compensation rates for all types of economic minerals produced."

"Then taxpayers' money will be assigned only for those types of work which are of countrywide importance. Such as, for example, the prediction of earthquakes and the study of global processes such as changes in the levels of the Caspian and Aral Seas, geoecology and global changes of the geological environment."

"What is now important is not to increase mineral reserves in general but to augment them in those areas and for those sectors which most acutely need raw materials at a given stage," Gabrielyants pointed out.

"Such reserves have been found: placer gold in the Magadan region, several oil deposits in the republic of Komi, a gas-field in the Poltava region in the Ukraine with a high yield, easily accessible deposits of barytes and building materials. The recently discovered reserves of fresh water in the area of the Aral Sea are of great value."

"Geological 'boundaries' originated millions of years prior to the emergence of man of Earth. And it is no

wonder that they do not coincide with the administrative division of the USSR," the minister said.

"Reserves of raw materials occur quite unevenly throughout the country's territory. Almost 100 percent of chrome ore reserves occur in Kazakhstan. 74 percent of manganese ore—in the Ukraine, 92 percent of the entire amount of oil is produced in the Russian Federation. A majority of gas reserves occur in the Yamal Nenets National District and the maximum concentration of oil is observed in the Khanty-Mansi National District."

"It is clear that under these conditions, in view of a single ecological space and the raw material monopoly of individual territories, a single countrywide policy concerning minerals and raw materials is necessary," Gabrielyants said.

New Consortium To Become 'Ecological Police'

91WN0343A Moscow NEDELYA in Russian No 7, 11-17 Feb 91 p 2

[Article by Iraida Semenova: "Are We Starting an Ecological Police?"]

[Text] They say that all our troubles are rooted in our eternal dependence on someone else. All problems will be resolved the moment we become independent.

Judging by all appearances, our green movement is quite serious in its desire to achieve freedom. The first step it has made toward this goal is the creation of a nongovernment organization for environmental protection.

The Green House Consortium will probably become an ecological police of sorts. Nine Union republics have already asked it to help them in their fight against ecological criminals. All four of its departments—commercial, ecological research, information and publishing, and data bank administration—will actively cooperate with local organizations.

The consortium intends to finance any work that can guarantee ecologically safe production. The amount of its institutional fund is a commercial secret. One may suppose, however, that it numbers several million, as the consortium has been instituted by major Soviet enterprises and foreign firms. The headquarters of the consortium does not have a permanent address since they have not yet found "premises."

Will the ecological police manage to bring some order into our filthy home? We would like to believe so, but we feel apprehensive of the circumstance that the law on environmental protection on which the founders of the consortium are pinning their hopes is still floating around the offices of those in power.

Greens Protest Over Moscow Environmental Problems

LD2503224291 Moscow Radio Rossi Network
in Russian 1300 GMT 25 Mar 91

[Text] More and more independent news agencies are springing up in our country. I now wish to hand over the microphone to my colleague, Aleksandr Shubin, who works for the Zelenaya Nit [Green Thread] News Agency:

[Shubin] The ecological situation in Moscow is becoming a bone of contention in local politics. On 21 March the capital's deputy mayor, Sergey Stankevich, held a meeting with the ecological commission. The deputies sharply criticized the actions of Luzhkov, chairman of the city's executive committee. Ignoring the ecological commission, he continues to allow construction projects which destroy the natural environment to go ahead in Yuzhnoye Butovo. Work is in fact continuing on the notorious Severnaya Thermal Power Plant. Construction of this project was halted a while back, after Moscow's deputies made an almost unanimous decision on this. According to Anatoliy Zheludkov, a Green deputy in the Moscow Soviet, the communist-controlled executive committee monopolizes all power and has no intention of sharing any of it with the Moscow Soviet.

At the last meeting of its coordination council, the Moscow ecological federation, which unites ecological groups in the capital, sharply criticized the plan for the development of Moscow adopted by the executive committee. This plan provides for a massive offensive on remaining woodlands and a new influx of manpower, which will not ease, but exacerbate the shortage of housing. The federation's alternative proposals are being completely ignored. The difficult conditions in which the ecological movements are having to operate are creating a tense situation.

Saiga Herds Seen Endangered by Government Policies, Export Efforts

91WN03424 Moscow RABOCHAYA TRIBUNA
in Russian 28 Mar 91 p 2

[Article by A. Shamenov, leader of the advisory office for ecology and the use of nature of the staff of the Kazakh SSR president: "The Flight of the Saiga"]

[Text] I recall how, when I was a child, my father would take me with him to a remote shepherd camp in the Karakum. The biggest holiday there was when they said farewell to the saiga. How beautifully they raced off, raising clouds of dust! And if you were especially lucky, you could see them close up—swift and fleet of foot. You would sit somewhere in a sheltered place and turn the eyepieces of your old binoculars. I still remember the feeling of excitement with the extraordinary beauty of the hook-nosed steppe antelopes.

Sometimes we would buy saiga meat from the villagers. They would sell it for maybe 5-10 rubles [R] for a whole carcass, unprocessed, with horns. For some reason, at that time the head of the saiga was not valued—skulls with horns were lying everywhere around the village.

We children especially loved kuyrdak—a hot dish made of antelope meat. True, we did not often get a chance to taste it: The shepherds hunted only in season and they did not break the law...

Now I work with saiga as a part of my job. Almost every day I see on my desk despairing communications from hunting inspectors and notes from scientists and specialists. Your heart aches when you learn how the public wealth is being squandered...

But my own impressions can come later. I shall begin with a telegram bearing the stamp "governmental." It was sent to USSR Prime Minister V. Pavlov by the republic premier, U. Karamanov. What is this? It turns out that the deputy chairman of the Union Council of Ministers, S. Sitaryan, had given permission to an enterprise in the Transbaykal area to ship five tons of saiga horns to China. Of course, a sharp protest followed immediately. But we have not yet received a response, although it has been more than a month.

The conflict has a long history. But first a little geography and biology... The saiga is an exceptionally rare kind of animal. Kazakhstan is practically the only place on earth where it has survived. Incidentally, the animal is not most valuable for its meat but for its horns. Until recently the republic was the traditional supplier of this raw material for the countries of Southeast Asia. From it, for example, they "created" potions from Tibetan medicine.

Our republic managed not only to preserve this disappearing breed of animal, but also to restore its numbers to the commercial level. There are now more than a million saiga in Kazakhstan. As many as there were 25 years ago. And all because there was a specialized state service—commercial hunting farms. Licenses were issued in keeping with decisions of scientists. The hunting inspections checked to make sure everything was in order.

But now the "cooperative age" is upon us. And the saiga have become the victims of unbridled greed. Numerous cooperatives, "joint enterprisers," and "private enterprisers" are all trying to get their hands on hard currency. The first to break into the international market was the Alma-Ata cooperative Sinegorye. Hundreds of greedy people who did not care about anything except their own profit burst into this profitable "branch." In all-terrain trucks equipped with the latest hunting weapons, sometimes even automatic ones, they conducted hellish chases across the steppe which ended with the mass slaughter of the animals.

During the past two years the "gentlemen of fortune" have killed more than 400,000 animals. The number of

head of saiga has decreased five- to sixfold as compared to 1987. In the opinion of scientists, this could lead to their complete disappearance in the republic in the near future. This was "helped" not only by neighbors from Uzbekistan and the Russian Federation but also by Baltic entrepreneurs who were working busily on the expanses of Kazakhstan. And all of them sent their booty outside the republic. And the licenses were issued by the USSR Council of Ministers without any consultation with the republic...

The result? The prices for the raw material dropped and the republic lost hundreds of thousands of dollars. The head of the republic, N. Nazarbayev, sent a special letter to the USSR Government. And finally the State Foreign Economics Commission of the USSR Council of Ministers adopted the decision to set a quota on saiga horns—31 tons for 1990. And what happened? During 10 months of last year the Prodintorg Association of the USSR Ministry of Foreign Economic Ties, under agreements with the cooperatives, enterprises, and various organizations, delivered 25 tons of saiga horns to Singapore. Moreover, USSR Council of Ministers Deputy Chairmen V. Nikitin and S. Sitaryan permitted the Altay Kray Ispolkom [executive committee] to ship eight tons of saiga horns to China, and their colleague, L. Voronin, generously issued Soyuzzagranpostavka a license for another 150 tons. This is out-and-out robbery!

And many of the businessmen stored up the raw material for nothing. I will name two organizations: the Podmoskovye Cooperative of the Moscow Oblast Consumers' Union and the Novomoskovskoye Agro-Industrial Association. They are headed by well-known people: Yu. Marinichev and V. Starodubtsev. Both are USSR people's deputies...

The Novosibirsk Oblast consumers' union, the Altay Kray consumers' union, the Dalso-Pasifik Joint Enterprise of the All-Union Association for Exports and Imports of Food Products, and many others failed to return to us the raw material acquired in violation of the Kazakhstan Government decree.

Taking into account the situation that has developed and trying to prevent a real ecological catastrophe, a group of people from Kazakhstan—USSR and Kazakh SSR people's deputies—appealed to the president of the Union. A regular government decree was adopted. And... again "bypassing" the republic, the export licenses were issued...

Recently I was visited by four chiefs of oblast state inspections for protection of the animal kingdom. And here is the alarming news they brought me: The price of a kilogram of this raw material, which is in short supply on the black market, has jumped to R500. Second-hand dealers are offering the shepherds in exchange for the horns—tea, vodka, sugar, and spare parts for vehicles.

Where can the saiga run or gallop off to? Where can they escape total destruction?

Saiga Horn Shipments to China Seized, Destroyed

91WN0343D Moscow KOMSOMOLSKAYA PRAVDA
in Russian 15 Feb 91 p 4

[SIBINFORM report: "Horned Regulations"]

[Text] The Transbaykal customs authorities have been seizing saiga horn shipments to China more and more often recently. Saiga horns are used as a rare medicinal substance and their price fluctuates from \$400 to \$600 per kilo. According to the regulations, after they are confiscated from the smugglers the horns are burned.

Repletion of Bukhara Deer Herds Reported

91WN0343C Moscow TRUD in Russian 26 Mar 91 p 4

[Article by AZIA-PRESS: "Bukhara Deer Find Homes"]

[Text] Ten years have passed since the day when 15 beauties—Bukhara deer—were brought to the Karachingil hunting unit in Alma-Ata Oblast.

The rare animals took, as they say, to the local environment and its protectors. The herd increased tenfold during that time. The Bukhara subspecies of red deer was included in the international Red Book a long time ago. They were almost totally exterminated even in their traditional habitat, the tugai thickets of the Syr Darya floodplain. Now we can say without fear that the Bukhara deer have found a new home for themselves in Karachingil. Moreover, they multiplied so well that the main administration for the protection of the Kazakh SSR fauna sent a letter to the international society for animal protection in which they offer to sell some of the Bukhara deer to zoos and wild life sanctuaries.

Scientist on Estonian Pollution Control Bottlenecks

91UN1070A Tallinn PÄEVALEHT in Estonian
26 Feb 91 p 2

[Article by Ain Laane, lead scientist at the Water Protection Laboratory Technical University of Tallinn: "Bottlenecks in the Way of Pollution Tax"]

[Text] The transition to market economy has a direct impact on our daily lives through prices and taxes. In late January, two articles appeared (RAHVA HAAL—"Clouding the Waters" and POSTIMEES—"Using Nature To Reach Into the Pockets of People") that deal with the implementation of Estonian government's decree Number 237, dated November 20, 1990, regarding: "Procedures for Taxing the Use of Natural Resources."

The authors of the decree, among others, should have foreseen the possibility of such articles appearing. To keep down confusion, the issues could have been explained to the people beforehand, through the media. However, there have been some obvious omissions in

this matter. Let us make an attempt, therefore, to arrive at some measure of clarity on some of the basic issues.

Who will pay for the expenses caused by polluting nature or efforts to reduce such pollution?

If, only a few years ago, you could read in the newspapers that the state will pay for all expenses related to environmental protection, subsidize agriculture, give free medical help and education to the people, then today this is no longer the case. Everybody knows that the state treasury is not a miracle chest from which you can draw, indefinitely. The state does not create wealth, but merely redistributes, according to need, the money it collects in the form of taxes from its population and its enterprises.

There is only one conclusion we can draw from this: The expenses resulting from polluting the environment and from reducing pollution, are actually borne by the individual—either directly in the form of taxes, or through the prices we pay for goods. This is the way it's done in all of the states. The only other way would be to leave these expenses for the future generations to pay. And so it is that we are paying today for what was left undone in Estonia over the years.

The only question is: Will it be done through taxes specifically earmarked for that purpose, or will other, indirect ways of raising the money be used. The old system of filling the state treasury, as practiced in the Soviet Union up until now, will obviously no longer suit us.

For industry, there is a third option. **Instead of the enterprise being taxed, it will be asked to solve its own environmental problems in accordance with state regulations, at its own expense.** Naturally, such expenses would then be figured into the cost of production. The advantage of that is that the enterprise can decide for itself which is more profitable: To build purification equipment or to replace the old production technology with one that is new and environment-friendly. The latter option is widely used in the economically developed countries.

Expenses for cleaning up pollution caused by the population will be paid by funds collected from the population. In most cases, these will go into the local budget, and the taxes can differ widely by the regions.

Hence, the final conclusion: If people want to protect their environment, they will have to forego a certain portion of their money either in taxes, or in some other manner, to clean up the pollution.

The idea of the pollution or contamination tax is not new. The problem has been studied in Finland and elsewhere, but no practical solutions have been found so far. Environmental protectors in Estonia took the bull by the horns, however, and decided to overcome the chronic lack of funds inhibiting this activity by imposing appropriate taxes for that purpose. The first steps were taken in the mid-80's and the final decree saw the light of day in November of 1990.

Who was the person who actually authored the idea of pollution and resource taxes in Estonia? This is a difficult question to answer, since the group of authors who came up with the decree has not been disclosed so far. I can say with confidence, however, that those who drafted the combined budget for the republic were not the authors of that idea.

It seems that the draft for this decree came to the budget makers as a gift they would have been foolish not to use. It also seems that they didn't take the trouble to weigh its material impact on environmental protection, the extent of funds actually collected, nor its effect on the prices of goods. Also underplayed was the importance of problems related to determining the quantities of pollutants released by individual enterprises into the environment through the sewage systems of the cities.

Since all ground pollution is channeled into the different bodies of water through pipelines and purification equipment belonging to the water and sewer production authority (VKTV), the burden of all future activity for collecting the pollution tax from its clients was left to be shouldered by the VKTV. VKTV acquired an additional, unpaid task of dividing the pollution tax total between the different enterprises. What compounds the confusion here is that only part of the pollution released into the environment is considered taxable. Trying to divide this tax total between the enterprises, while there is no way, and no necessary means of measuring the amounts of pollutants, represents a serious research challenge.

This does not mean that environmental protection officials have become the well-meaning hostages of money collecting budget makers. Actually, environmental protection officials have become the victims of their own erroneous idea, believing that it would be possible to build the sewage purification equipment so necessary for the environment with the devaluating ruble that has no material backing. The responsibility assumed along with the collection of money is extremely great, and the failure of the operation could discredit the whole department. Strategically, it would have been more correct to forego the collection of money and to require that the enterprises spend these monetary resources on the implementation of environmental measures.

What was the objective of the resource and pollution tax?

The most general objective was to force both the enterprises and the population to develop a rational attitude about natural resources, to collect money for building the much-needed sewer facilities, and also for financing water studies.

As for the intention of using tax to force the population and the enterprises to develop a rational attitude toward the environment, it seems not to have succeeded for the time being. The taxes are simply incorporated into the price of the goods and, under conditions of a deficit

economy, their saleability is determined by their availability, and not by their price. Not until we have competition in the marketplace, can the price mechanism kick in, and help us realize the positive effect of the resource and pollution tax. At the same time, we have to consider the competitiveness of our goods on the foreign market. We also have to keep in mind that the pollution tax imposed by law will have a protective effect on the environment only as long as the expenditures made to remove pollutants are smaller than the tax total. A further increase in the effect of purification would result in losses to the enterprise. This is obviously one of the main reasons why Finland, Sweden, Denmark, and the FRG do not have fixed pollution fees for individual substances.

What are the practical options for taxing the population and the enterprises?

As a rule, taxes are based on quantities that are relatively easy to check such as the size of the land, value of the real estate, sales volume of the enterprise or the size of an individual's income. The veracity of the information submitted to the taxation office is the responsibility of the taxpayer. To disclose cheating, random checks will be made and violators fined.

In the case of pollution tax, it would stand to reason that the measurement of pollutant amounts be the responsibility of the enterprise.

But how should the pollutant amounts of the population be measured? In practice, it could be done only on the basis of some statistical average.

Pollution tax is based on the amounts of different pollutants discharged into the bodies of water. The basic problem, in determining these amounts, is the wide variation in the flow rate and pollutant concentration of the effluent within an hour, a shift, a 24-hour period, a week, a month or a year.

To determine accurate amounts of pollutants, both the flow rates and pollutant concentrations of the effluent would have to be measured according to a certain program. Since we don't have automatic measuring devices for this purpose, special research would have to be conducted to determine the necessary frequency of measurements. All this can be done if the enterprise discharges its effluent directly into a body of water.

The situation becomes considerably more complicated, however, when we are dealing with Tallinn, for example. First, we will have to know the amounts of pollutants released into the city's sewer system by different enterprises. Secondly, we will have to know to what degree the city's purification equipment has reduced the amount of pollution for each of those enterprises. In practice, the latter amount would be impossible to determine. That leaves us with only one option of dividing the pollution tax not according to the actual amounts of pollution released into the sea, but proportionately, according to the pollution amounts released into the sewage system.

Thus we have indeed arrived at the universal average index, that satisfies the party demanding payment, but not the one doing the paying.

The only way for the enterprises to determine the pollutant amounts is to have studies done for that purpose, the results of which would have to include recommendations for reducing the pollutant amounts of the enterprise. One should be warned, however, that the problems of dividing the pollution tax cannot be solved by such a study, since the tax is based on the amounts of pollution released into the environment, and not on amounts released into the sewage.

With the population, the situation is considerably more complicated (simpler?). Research has established the average amounts of organic matter, phosphorus and nitrogen released into the sewage system over a 24-hour period. Deducting from that pollution amounts removed by the purification equipment, leaves a total of 30 rubles a year to be paid by each inhabitant of Tallinn for the amount of sewage dumped into the sea. Out of that amount 8.7 rubles are for organic pollution, 1.3 rubles for phosphorus, and 20 rubles for nitrogen. After the 1994 activation of the second stage purification facilities in Tallinn, the pollution tax would be reduced to 22 rubles, 20 rubles out of which would be for nitrogen. At the same time, however, fees for the sewer services will be going up. Assuming that there are half a million people using sewer services in Tallinn, the total tax to be collected for pollution in 1994 would be roughly 10 million rubles.

By way of comparison we can say that, according to the VKTV of Tallinn, they have managed to spend about four million rubles a year on building new sewer facilities. It was not money, but the lack of building capacity that caused the building of purification facilities to snag. Money to be collected in the future could be used to expand the purification facilities so that nitrogen compounds could also be removed. Considering, however, the high cost of the purification process, the removal of nitrogen compounds has posed a serious problem to all developed countries on the Baltic Sea. To this day, the Helsinki Commission has not reached a consensus on the need to remove nitrogen, or on the minimum concentrations allowed.

Hence the question—do we have the right to tax the population for releasing nitrogen compounds into the environment as long as we do not have the technical or economic means of removing nitrogen compounds?

The experiences of Finland, Sweden, FRG, and Denmark show that after restoring their economies, beginning in 1965, the financing of environmental measures was off to a more serious start. Time has passed and this tactic is obviously no longer suitable for us. We have to resolve our environmental production problems simultaneously with the reorganization of industry. Our primary task is to establish technologies that are environment-friendly, and only then turn to the elimination of residual pollution.

The article deals with only some of the bottlenecks in the way of the pollution tax. Similar problems have also emerged in effecting taxes in other areas of our lives. It seems that different branches of the economy are making isolated attempts to collect money for the completion of tasks in their own areas, without coordinating them with the general interests of the state. The government, however, is not capable of creating order during the transition period, while the Soviet law is supposedly no longer in effect, and the Estonian law has not taken effect yet.

What really matters is that we learn from our mistakes, and that remarks made over time be considered when the pollution tax decree comes up for a review. The decree we have now, based on firm prices and rates of exchange, cannot be useful over a longer period of time.

If we want to become full-fledged members of the Baltic Sea Environmental Commission in the future, we should begin right now, while drafting our new laws, to take advantage of the applicable experiences of all the countries around the Baltic Sea.

Kiev Birthrate Down, Death Rate, Radiation Up

PM2803165391 Moscow KOMSOMOLSKAYA
PRAVDA in Russian 26 Mar 91 p 4

[From feature comprising INTERFAX, POSTFACTUM reports: "The Birthrate Falls..."]

[Text] There has been a fourfold decrease in the natural increase in Kiev's population over the past two years. Per 1,000 head of population this indicator has now reached its record low for all the years of observations.

In the opinion of demographers, this is a result of the critical socioeconomic and ecological situation in the city. It has made for the drop in the birthrate and the increase in the death rate among Kiev residents. INTERFAX's correspondent was told at the city statistical administration that the birthrate in Kiev has fallen 12 percent over the past two years alone, while the death rate has increased 5 percent.

...And Radiation Rises

Vladimir Boreyko, director of an independent ecological-cultural center created in August 1989, reported in an interview with the POSTFACTUM agency that, according to his data, the background radiation in one apartment in every 10 in the city is 50-100 percent above the norm. Boreyko emphasized that the increased background may have been caused by things that have been brought out of Chernobyl and have, maybe, ended up in Kiev homes by way of the black market.

Kiev Water Supply Dioxin Content Investigated

91W N0326A Kiev KOMSOMOLSKOYE ZNAMYA
in Russian 5 Mar 91 p 6

[Article by Valentin Smaga, KOMSOMOLSKOYE ZNAMYA commentator, leader of the Green World club, telephone 441-86-51: "Dioxin in Kiev?"]

[Text] Scientists in Moscow charge \$3,000 for analyzing one sample of drinking water to determine the presence of a substance whose poisonous properties exceed those of potassium cyanide.

The saying is true: The less you know the better you sleep. At times, the daily routine in newspapers makes us look at a little stream of kitchen tap water as if it were a fuse tied to an air bomb. A drunken engineer smashed a tank car filled with phenol somewhere in the vicinity of Smolensk, and all of Kiev read the reports about this filth floating down the Dnepr as if they were communiques from the front line. As soon as this blew over, there was another problem: They decided to combat ice jams on the Pripyat with aerial bombs. This stirred up all the radioactive silt on the bottom which had accumulated since the Chernobyl disaster...

A. Goncharuk, director of the Institute of Colloidal Chemistry and Water Chemistry of the Ukrainian SSR Academy of Sciences, served up still more "pleasant" news. Speaking at a regular meeting of the academy presidium, he communicated that... dioxin was found in running water in Kiev. Let me remind you what that is. Polychlorinated hydrocarbons (such is the scientific name of the substance) are extremely toxic. The presence of even small doses in drinking water causes people to be aggressive "for no reason" and destroys the liver. The Americans used dioxin as a toxic chemical agent during the Vietnam war. Children with deformities are still being born in Vietnam because of this. Pilots who sprayed dioxin over the jungles had to be sterilized...

The director did not cite specific data on the presence of dioxin in Kiev's drinking water, but he did refer to data for Moscow. Every resident of "the hope of the world and the heart of all Russia" takes in the following dose of dioxin: 10^{-9} grams per liter, which is 1,000 times more than the highest permissible concentration. The entire pathos of the speech by V. Goncharuk, corresponding member of the Ukrainian SSR Academy of Sciences, as I understood it, was reduced to the fact that American equipment should be purchased in order to urgently study this issue. Those Muscovites who have the equipment charge a lot of money for every test.

A very interesting hypothesis was also voiced. Dioxin has not been found in the Dnepr and Desna water-intake facilities. However, it is present in the piped water supply. It is quite logical to assume that the poison is somehow generated in the process of the chlorination and ozone treatment of water at special stations...

This version appears quite convincing to me. We ourselves, rather than the infamous agents of an imperialist intelligence service, blew up Unit No. 4 at the Chernobyl Nuclear Power Station. Why is it impossible for the delivery of a lethal poison to the kitchen of every housewife to be a man-made miracle? I am eager to believe in the good intentions of V. Goncharuk. However, the reserved statements by the director concerning the presence of dioxin in Kiev's water, which flashed on

newspaper pages, led to nothing but rumors. Any change in the color and smell of water brings scores of telephone calls to various echelons. This convinces me personally of one thing only: Our system of ecological information is not capable of creating anything but panic. For example, the so-called "green telephone" of the Kiev City Committee for Environmental Protection has been extensively advertised. I dialed 417-81-20. It turned out that this was the phone of... the secretary of the committee chairman, whereas so-called "dispatchers," which were supposedly able to clarify the issue of the presence of dioxin in the water, were found at another phone number: 212-28-94. I tried for two days to contact anyone at all. I did not succeed. Anyone who so wishes may duplicate my attempt to call the "ecological ambulance."

In April 1986, Sweden's ecological services saved many of their fellow citizens from trouble by disseminating through the press recommendations on the simplest methods for combating radioactive contamination which, as you know, emanated from the Chernobyl Nuclear Power Station. Unlike the Swedes, we were fooled for a long time. As we have found out, even now, five years after the catastrophe, it is by and large impossible to obtain reliable information from state organizations on how a person should behave in the event of radioactive, phenol, and dioxin (the list may be continued) contamination of water.

In the years of perestroika, public organizations have also been unable to resolve this elementary issue and establish an effective system for providing ecological information to the populace. Moreover, at present they are as disjointed as ever.

The public council of the Ukrainian SSR State Committee for Ecology, of which I am honored to be a member, has turned into a hollow talkathon. The Ukrainian ecological association ZELENIY SVIT, to which so many hopes were attached, has become excessively politicized. Unions and petty unions with the sinister word Chernobyl in their names are cropping up by the dozen. There are headquarters and committees to save the Dnepr, the Azov and Black Seas, public institutes of ecology, and even the Our Land association which unites gardener-land reclaimers who have brazenly built a dam in the Koncha-Zaspa natural area... If this continues Ukrainian land may indeed become their land, it will become as salinated and devastated as the zone of the Danube-Dnestr canal built by the Ministry of Land Reclamation and Water Resources.

KOMSOMOLSKOYE ZNAMYA is setting up a new Green World club, precisely for the purpose of helping environmental-protection organizations come down to earth from the heavens and learn how to really protect the people against ecological troubles. The people should not be left defenseless. Dioxin is already in the kitchen.

Georgian Greens Council Chairman Outlines Program, Accomplishments

91WN0324A Tbilisi VESTNIK GRUZII in Russian
7 Mar 91 p 2

[Interview with Zurab Zhvaniya, chairman of the Greens Party Central Council and speaker of the Georgian Greens Party, by VESTNIK GRUZII correspondent Vakhtang Akhalaya; date and place not given: "We Will Save Life..."]

[Text] [Akhalaya] Zurab, on 3 March in Tbilisi, the Second Congress of the Georgian Greens completed its work. Why was it held behind closed doors?

[Zhvaniya] We actually did not invite guests, neither Greens from abroad, nor representatives of Georgian political organizations, with a slight exception. The fact is that this congress was of a purely working nature. We had to analyze the path we had traversed and determine tactics for operating under the new conditions that have evolved in Georgia.

[Akhalaya] The current "combination of posts," probably, reflects the process of the future politicization of the "Green" movement in the republic?

[Zhvaniya] On the contrary, inasmuch as I was elected chairman of the central council at the congress. But according to the new regulations, this position is combined with the duties of the speaker of the party. This means that political activity of the Greens will not predominate over environmental protection. The congress legitimized the position that the movement and the Greens Party of Georgia are organizationally combined. The Georgian Greens today are an association of people which, realizing the complete criticality of the situation that has evolved, both on a global scale and in the republic, and sensing its own responsibility to future generations, is ready to act energetically.

[Akhalaya] You have in mind, of course, not only the ecological situation...

[Zhvaniya] Of course, you see, fundamental changes in the sphere of the restoration and protection of the living environment in Georgia are impossible without the same kind of radical changes in the economy and in the system of the sociopolitical structure. But they are possible only with the achievement of the full state of independence of our republic.

Necessary Commentary

It seems that not very much time has passed since April of 1988, when the "Green" movement was started in Georgia—an ecological association has been created in the Pan-Georgian Society of Rustaveli. In December of 1989, the first congress of Georgian Greens was held—an announcement was made about the creation of the movement as an independent sociopolitical organization. In March 1990, the Georgian Greens Party arose in the midst of the movement as its most politicized

nucleus. There are already a thousand people today in the ranks of the "Green" movement. This includes scientists, representatives of the creative intelligentsia, students, peasants, and workers united in 31 rayon, city, and kray organizations. The main principles: harmonious coexistence of society and the environment, ecological safety, democracy, and nonviolence. The methods of struggle: actions of protest, picketing, rallies, etc.

[Akhalaya] The Greens today are in opposition—according to the results of elections to the Georgian Supreme Soviet, they did not receive even one seat in the parliament; however, as far as I know, they are taking part in the work of its commissions...

[Zhvaniya] Only individual representatives. While this participation is purely symbolic, we are preparing for more constructive cooperation. Just as soon as the Land Use and Ecology Commission was established in parliament, we submitted a list there of our representatives—specialists in this sphere. Unfortunately, they convened only once, at the end of November of last year.

[Akhalaya] So, are they included on the commission staff?

[Zhvaniya] This question is not yet clear to us. I must note with chagrin that a draft on the arrangement of a state environmental protection system that we submitted was also ignored completely. It was not reflected at all in the concept of the creation of a Ministry of Ecology of the republic, which was adopted by the Supreme Soviet. Today, the activity of this ministry still does not indicate decisive steps in the matter of bettering the protection of the environment and overcoming the crisis in the ecological situation. On the contrary, we sense certain negative trends.

[Akhalaya] Exactly what alarms you?

[Zhvaniya] The renewal of large-scale construction of a whole series of ecologically dangerous installations, dropped through the combined efforts of the national movement of the republic, is becoming a real danger. Discussions are going on at the very highest level regarding the Khudoni GES [Hydroelectric Power Station], which is based on incompetent findings.

[Akhalaya] A final decision has not been made yet.

[Zhvaniya] Nevertheless, in the settlement of Dzhavarzen, where the Ingurstroy Administration is located, intensive preparations are already being made.

[Akhalaya] A severe power famine is present in the republic. However, it is unreasonable to satiate it at the expense of an artificial deepening of the abyss of ecological catastrophe...

[Zhvaniya] Moreover, none of the references to the criticality of the power problem are warranted. You see, such grandiose construction will drag on for not less than 10 years, requiring tremendous resources. In addition,

the Khudoni GES is a peak-load power station, but there is no shortage of peak-load electric power in Georgia, which is presented in abundance by our rivers in the spring-summer period. But the existing deficit in elementary electric power, which is created artificially, basically owing to the incomplete delivery of fuel to the republic for thermoelectric power stations, cannot be covered in the winter, even if 10 Khudoni GES's are built. But how justified is the decision of the Georgian Republic Council of Ministers concerning the renewal of the construction of the Lakbe Reservoir, the chief structure of the new land reclamation system in Kakheti. No important agro-economical basis exists to make its creation necessary. Not to speak of the destructive ecological consequences.

There is talk about the start of construction of a lithopone plant, and I note—on imported material—in the village of Geguti, not far from Kutaisi, where the ecological situation is already strained. It was put off at one time as a result of actions of the Greens of Tskhaltubo. Thorough ecological expert analysis is needed in connection with the planned construction of circular furnaces for coking coal in Zestafoni...

[Akhalaya] Since the opinion of the Greens is not being heeded in the leadership spheres, it will become necessary, very likely, to stand up for your principles?

[Zhvaniya] For the time being, we have refrained from our traditional protest actions. The situation in the republic is too tense even without this. We are all living through the events in Samachablo with aching hearts. But if our economy is not put on the "Green rails" of ecological safety, and if a dialogue is not held at the summit, the Greens will not be silent, and they will not go for any compromises.

[Akhalaya] Are you confident that the population of the republic will support you?

[Zhvaniya] Our most important principle always was and remains total openness in protecting the interests of the health of the people, and of future generations, regardless of the political situation. And the people believe in us...

Necessary Commentary

Indeed, it is very sad that the anxious voice of the Greens is still not listened to very much at the apex of the pyramid of authority. For it resounds with sincere alarm over the health, life, and fate of each of us—of all of those who are at the base of this pyramid. Why not use the knowledge and energy of these honest, respectable, and competent people, good specialists, and real patriots of Georgia, who created a powerful environmental protection organization that enjoys the broad support of the population? The corresponding parliamentary commission and the new Ministry of Ecology of the republic have thousands of volunteer helpers who are dedicated to their cause. It simply does not make sense not to take them into account...

[Akhalaya] In connection with the deteriorating situation in Samachablo, and the unabating conflicts in the Transcaucasus, and in the Caucasus as a whole, how realistic today is your basic slogan "The Caucasus is our common home?"

[Zhvaniyaj] Our idea of an all-Caucasus home is not always understood accurately. It is just the exact opposite of the imperial policy of "Divide and rule!" which was always conducted with extreme cruelty and perfidy with respect to the people of the Caucasus. Today, this policy has as its aim to subject them to an abyss of interethnic and religious wars, and to prevent the attainment by our republics of state independence.

As for the bloody orgy of the Ossetian separatists in Samachablo, using our overall Caucasus relations, we are applying all efforts so that the people of the Caucasus receive true information about this. Moreover, at the second congress, we also decided to activate our international relations more energetically.

[Akhalaya] These relations are being broadened continuously. Are you able to use them in the interests of the republic, and, most of all, to ensure international recognition and integration in the all-European process?

[Zhvaniya] We are really actively cooperating with the Greens in various countries. For example, an agreement has been reached with the Black Sea and Danube area states about cooperation in the resolution of the ecological problems of the Black Sea. The next meeting of European Greens is to be held at the end of March, and its agenda includes a change in the status of our organization as an observer. We will become a full-fledged member of the community of "Eurogreens."

[Akhalaya] What are your specific achievements?

[Zhvaniya] For example, specifically relating to the joint efforts of the Greens of Georgia and of Estonia, the "Eurogreens" became the first political force of Europe which as early as March of last year absolutely unequivocally declared full support for the struggle of the Baltic republics and Georgia to restore full state independence. We intend in the future as well to actively use our international relations in Georgia's interests.

Necessary Commentary

The "Eurogreens" today are one of the most influential, united, and well-coordinated political organizations in Europe and in the world. It has its factions just as in the European parliament, as well as in the parliaments of the 15 European states. Businessmen and politicians take it into consideration. The forthcoming entry into it of the Greens of Georgia is an important event in the life of our republic. This is practically the first step on the threshold of the all-European home. And for this reason it is so important for all of us, starting today, to do everything together, to support the Greens in their noble cause, and

to heed the voice of reason and think not only about today, but also about that lot that we are preparing for future generations.

Bratsk Declared 'Ecological Disaster Zone'

PM2703143991 Moscow *IZVESTIYA* in Russian
25 Mar 91 Union Edition p 1

[SIBINFORM report: "Serious Respiratory Problems Follow Komsomol Youth"]

[Text] Oblast Soviet deputies have declared Bratsk City an ecological disaster zone. This decision was preceded by a number of fruitless appeals to high-ranking union institutions and warning strikes at Bratsk educational establishments and enterprises. It is not known whether Bratsk's new status will change the situation, but the chairman of the City Soviet has warned that unless the state of the environment improves, he will resign by 1 May, SIBINFORM reports.

Bashkir KGB Chairman Takes Active Environmental Protection Stance

91W0343B Moscow *SELSKAYA ZHIZN* in Russian
13 Mar 91 p 6

[Article by TASS correspondent R. Tukhvatullin and SELSKAYA ZHIZN correspondent K. Shakhvaliyev: "KGB People Among 'The Greens'"]

[Text] On 11 March the Bashkortostan KGB appealed to the Bashkir SSR Supreme Soviet with a request to declare five regions of the republic disaster areas. By the KGB officials' estimates the ecological situation in the republic passed the critical mark a long time ago. Millions of tons of toxic waste have accumulated on the territory of Bashkiria. Most of it can be qualified as lethally dangerous.

The republic is literally teeming with oil refining and oil processing plants, and all their equipment exhausted its resources a long time ago; it should be written off, but the plants continue to use it. This leads to accidents, leakages of the most poisonous chemicals, and deaths.

"Environmental protection is currently the most important social and political task," General V. Podelyakin, Bashkir SSR KGB chairman, believes. "KGB officials understand the concern of the local residents and cannot feel indifferent to it. We breathe the same air and drink the same water as the rest of the people in Bashkiria."

Recently, General V. Podelyakin took part in a mass ecological action organized by the [Ufa] City Soviet Executive Committee as a protest against the Khimprom Association, which allowed phenol and dioxin to leak into the city's drinking water. The general then lead the "human chain" that surrounded the entire city.

More on Consequences of Alleged 1979 Sverdlovsk Anthrax Outbreak

91WNO3454 Moscow POISK in Russian No 50.
14-20 Dec 90 p 3

[Article by POISK correspondent Lidiya Usacheva: "Code 022—Death"]

[Text] Beginning 4 April 1979 people started dying in Sverdlovsk every day. They were dying of an unknown disease; very often they did not even make it to the hospital. They were running high fevers, they were weak, and they felt as though they were suffocating; very few of them could walk to the ambulance without somebody's aid. Doctors diagnosed them with "pneumonia."

I talked to some of the people who lost their loved ones that spring. They told horrifying stories:

"This is a picture of our Tanechka. She loved children so much; she worked as a kindergarten teacher. She knew so much poetry, so many songs. She passed away so young, as if she lived only to raise other people's kids, without having her own..."

"I was afraid to let my husband go to work, so many people were dying then. He would just open the door and I would go after him and cry. And he used to tell me so kindly, in such a down-to-earth manner: 'Don't cry; I'm not going to die.' But he did—on a holiday—on the First of May."

"They took my Vitya to the hospital and I thought he would get help there. As I said good-bye to him, I told him not to expect us the next day, and I promised to come the day after. But I got there on the second day and did not find his name in the patients' list..."

Sverdlovsk Hospital No. 24 in Chkalovskiy Rayon was hit first. This rayon is the location of one of the largest enterprises in the city—the earthenware factory, as well as a military research facility known as Station 19. This rayon had the greatest number of sick.

"On the morning of 5 April, I went to the hospital's therapeutics department and there I saw four dead people, still in their own clothes. No one had looked at them"—thus Professor A. Volkova recalls her first encounter with the terrible and mysterious disease. She was working in Hospital No. 24 then.

In spite of several deaths, no doctor could establish the cause for a long time. Only during the post mortem examination on one of the deceased, did an experienced pathologist at Hospital No. 40 notice that the network of small blood vessels in the brain membrane had been hemorrhaging. From that he concluded that there was an outbreak of anthrax in the city.

"Never before had I had to deal with anthrax," says pathologist F. Abramova. "I knew about it only from text books. But this time there were no doubts, as all of its symptoms were present. We managed also to identify

the infection carrier—bacillus anthracis. But where was the source of the infection?"

Doctors were blaming the infection on sick animals and they were appealing to city residents through the periodical press to observe preventive measures: not to buy any uncheck meat from private sellers; to boil meat as long as possible. Checkpoints were set up on all roads leading into the city where they confiscated and destroyed any kind of meat. Newspapers mentioned instances of cattle anthrax in Syserts'kiy Rayon, which bordered Chkalovskiy Rayon.

The contaminated meat version remained the only and indisputable one for a long time. It also received some authoritative support. Epidemiologist I. Bezdenezhnykh and infection specialist V. Nikiforov, corresponding member of the Academy of Medical Sciences, explained to the public that the territory of Sverdlovsk Oblast was considered anthrax epidemic-prone and the infection of people was preceded by an outbreak of the disease among cattle. The infection was transmitted through meat bought from private sellers or when carcasses of the sick animals were dressed.

But other rumors were circulating in the city as well. On the streets and in the lines people kept saying that the high fence in Chkalovskiy Rayon was not hiding a military research facility, but rather some laboratory that was designing the means of antibacteriological protection. The substance "broke through" and affected this very rayon before others.

The Sverdlovsk people gave rather plain reasons for this: If meat was the only problem, why then were house roofs so thoroughly hosed down in Chkalovskiy Rayon? Why were soldiers in gas masks sweeping the streets, and why, in some places, did they even remove the top soil and repave the roads? Why were there very few families where several people would die at once after eating the meat? Why were there especially many victims at the earthenware factory?

"Our factory became a funeral parlor," said metal worker Boris Klyuzhin. "Nobody worked in the shops; they were making tombstones and fencing for graves; they were washing the walls and the roof and changed the siding. Obituaries kept appearing every day; later they simply stopped putting them out, so many people had died."

Who was right? It is very difficult to get at the truth today. Not a single medical record with the 022 code (it denotes anthrax in medical documents) has been preserved. There is not a single post mortem examination record, not a single microsection with the "portrait" of the lethal bacillus. A number of personnel files of those "terminated due to death" disappeared in a strange way from the records of the earthenware factory and I could not find out the names of all the dead. According to official data, anthrax killed 64 people. But very few people believe this figure, as very few people recovered and hundreds of them were brought to Hospital No. 40...

The sinister laboratory that had caused rumors in the city or, rather, the Science and Research Institute for Vaccines, was shut down in 1986. The high fence named Station 19 today is hiding the military epidemiology section of the USSR Ministry of Defense Science and Research Institute of Microbiology. The Sverdlovsk residents demand that the mysterious station be closed immediately, because they consider it the cause of the 11-year-old tragedy. But the military doctors have their own arguments: As long as there are bacteriological weapons in the world we need an "antidote." But who can guarantee that this "antidote" will not jump the fence of Station 19 once again? POISK is hoping to conduct its own investigation of these events of our recent past.

Official Responds to Criticism of 'Aral' Consortium

91WN0327A Moscow PRAVDA in Russian 28 Feb 91
Second Edition p 6

[Interview with Baltash Moldabayevich Tursumbayev, chairman of the Aral Consortium council and state adviser to the Kazakh SSR Cabinet of Ministers, by V Zaytsev; place and date not given; followed by commentary by A. Tsygankov, deputy chairman of the USSR State Commission on Emergencies: "Aral: The Second Attempt"]

[Text] *Lately the problems of the Aral have once again attracted the attention of the organs of authority and administration and of the public. For this year alone 2,605 million rubles have been allocated for capital investments*

Journalist V. Zaytsev interviewed B. Tursumbayev, chairman of the Aral Consortium council and state adviser to the Kazakh SSR Cabinet of Ministers.

[Zaytsev] Baltash Moldabayevich, why did it become necessary to create this consortium, and what is the history of this problem?

[Tursumbayev] As is known, the problems of the Aral Sea were actively discussed in the 1960-1970's; however, the problem emerged in its most acute form in the 1980's, when the negative ecological and socioeconomic effect of the decreased sea level on the adjacent regions became clear.

[Zaytsev] What are the main tasks of the new entity?

[Tursumbayev] The consortium's main tasks are to work out and implement a Union-republic program of improving the ecological situation and social conditions of the population living in the Aral area, as well as actions directed at the recovery of the Aral Sea.

Aral combines capital investment and material and technical resources of the Union, republic, and local

organs of state administration, it is financed as a Union-republic organization with money from the USSR, republic, and local budgets.

[Zaytsev] Will the consortium not become just another bureaucratic structure?

[Tursumbayev] It is our firm belief that it will not. We saw new opportunities behind a seemingly structural reorganization. First of all it is an opportunity to combine the research and development potential, organizational experience, and production capacities of the Union ministries and departments and USSR and republic Academies of Sciences and their institutes with the potential of construction and waterways organizations and construction industry enterprises on both the republic and the local level.

Second, the consortium will have a flexible structure and be open to new members, including foreign ones, which in turn gives us room to maneuver, to get enterprises and organizations based on any form of property involved in solving the tasks on the basis of competitive bidding and contract work.

[Zaytsev] It is known that the consortium's activities are governed by the special resolution of the USSR government. Since the consortium is a Union-republic entity, would it not dictate its will to the republics?

[Tursumbayev] The democratic foundation and equality are inherent in both the agreement on the creation of the consortium and in its rules. These basic documents stipulate that the consortium's highest governing organ is the council, which consists of two representatives from each founding organization, from the USSR Academy of Sciences, and from the USSR State Commission on Emergencies, which is charged with the coordination of and control over the solutions to Aral problems. The council conducts its activities on the basis of equality and—as the two first meetings showed—fully takes into account the interests of all founders.

Commentary by A. Tsygankov, Deputy Chairman of the USSR State Commission on Emergencies:

"I would like to emphasize that earlier emphasis was on the adoption of all-encompassing resolutions of the directive organs, which stipulated in detail the tasks and executors involved in resolving the problem.

"Taking into account today's realities, this method does not meet the demands of today's situation. In our approach to the Aral problem we assume that it is necessary to take into account not only the economic but also the social and national peculiarities of each of the republics.

"Under these conditions, a correct determination of the direction of the consortium's activities—a determination that will take into account the interests of all who live in the Aral area—becomes a priority. Therefore, after careful consultations with the governments of the republics, scientists, and specialists on potential forms of

organization for this task, the idea of creating a Union-republic Aral consortium was proposed. I want to note that during the developmental stage of this idea none of the republics put the issue in the light of a "we do not need the center" attitude. In my opinion, this is an example of a carefully weighted political approach to administrative-economic issues."

Academy of Sciences Official on Probability of Siberian River Diversion Project

9/BN0327B Tashkent *PRAVDA VOSTOKA* in Russian
9 Feb 91 p 2

[Article by S. Ziyadullayev, member of the Uzbek SSR Academy of Sciences and chairman of the USSR Academy of Sciences Scientific Council's Commission on Regional Problems of Central Asia and Kazakhstan: "A Miser Pays Twice: There Is No Alternative to the Siberian River Diversion"]

[Text] According to scientists and specialists' calculations, the water resources of the Syr Darya and Amu Darya [Rivers] are almost completely exhausted. If the necessary measures for the preservation of the water resources are taken, and progressive irrigation methods are used in all branches of the national economy, the region's water resources will last at best until the year 2000.

How are we to live afterward? How to develop the economy, especially agriculture? How to provide for the fast-growing population's food needs in the environment of irrigation agriculture?

The overwhelming majority of scientists and specialists in water management have only one answer to these questions: What is needed is an interregional redistribution of the water resources, that is, diversion of part of the Siberian river flow into Central Asia and Kazakhstan. This issue was studied for 10 years; several Union resolutions were adopted; research and development work was done in the USSR Academy of Sciences Institute for Water Problems, in the All-Union State Research and Design Institute for Waterways Management, and so on. These studies took into account economic, ecological, and other factors; specialists and scientists from Uzbekistan and other republics actively participated in them. They were discussed many times at scientific conferences, symposiums, etc. Very regrettably, however, the opponents of the diversion won, and all work was stopped by decision of the CPSU Central Committee and the USSR Council of Ministers of 16 August 1986. However, considering the shortage of water resources in our region, the same decision directed the USSR State Committee on Science and Technology, the USSR Academy of Sciences, and the Academy of Agricultural Sciences imeni V.I. Lenin to "continue the study of scientific problems related to the regional redistribution of the water resources on the basis of comprehensive ecological and economic research, the use of

modern economic and mathematical methods and technical means, as well as thorough analysis of both domestic and foreign experience in this area." This offered some hope that the problem will finally be moved toward solution. Unfortunately, this part of the decision is not being carried out, although four years have passed since then.

As far as we know, this point of the decision is not reflected in any research or development plans of any Union institute.

The problem of water resources is most topical for Central Asia and Kazakhstan. Not only the fate of the multimillion population of the region but the industry's supply of highly important raw materials and the population's food supply depend on the potential solution of this problem. Moreover, a decision of the CPSU Central Committee and the USSR Council of Ministers of 19 September 1983 suspended construction of large irrigation systems and utilization of new areas of irrigated land in the Aral Sea basin on the basis of the Amu Darya and Syr Darya basins' water resources starting 1991. This was decided because the water resources are already approaching exhaustion, and there have been more dry years lately, which inflicts considerable damage on the region's economy. Suffice it to say that during the previous decade 1981, 1983, 1985, and 1986 were dry years.

We are wasting valuable time on the resolution of the diversion problem. It will take 10 to 12 years to accomplish the project of a partial diversion of the Siberian river flow. Therefore, now is the time to start, and preparation work can be completed in the next few years.

Until this global solution is in place it is necessary to speed up the reconstruction of the entire irrigation system so that the remaining water resources can be used economically.

It is not possible to even somewhat increase the area of irrigated lands on existing water resources without reconstruction. There is now 0.21 hectares of irrigated land per capita in Uzbekistan; according to specialists, by the year 2005, given the stabilization of irrigated lands, this indicator will decrease by more than one-half, making it impossible to ensure the necessary level of agricultural production to satisfy the needs of the region's republics and fulfill the all-Union tasks.

The Union organs formulated the issue correctly—to continue scientific research aimed at solving the problem of the region's water resources. I heard with satisfaction the statements by Uzbek SSR President I.A. Karimov, who insists on the necessity of solving the problem of the Siberian river flow diversion into our region. By the way, it is a significant sign that *LITERATURNAYA GAZETA* is also raising this issue again ("Water as a Cause of Fire," January 16 1991).

I totally agree with American scientist Professor P.P. Micklin in his opinion that the "Soviet government may have to return to the project of partial diversion of the

Siberian river flow in the 1990's, not only out of water management considerations, but also out of political and social considerations."

The delay in solving the problems of the Aral Sea and the Aral area has led to an ecological catastrophe, although scientists of the Council for the Study of Productive Forces of the Uzbek SSR Academy of Sciences were concerned with it 16 years ago. Now not only an all-Union government commission but even the United Nations is involved in resolving this problem.

Therefore we should not delay the solution of the problem of interregional water resource redistribution.

Despite all the current difficulties, one wants to believe that the country will soon enter the wide road of a market economy and an opportunity will arise to deal with the most serious and vitally important issues aimed at strengthening the economic sovereignty of the republics within the renewed all-Union federation. **The important thing is not to waste time that is precious for the development of future productive forces.**

Chairman Outlines Tasks of Kazakhstan's Ecology Committee

91WN0328B Alma Ata KAZAKHSTANSKAYA PRAVDA in Russian 25 Jan 91 p 3

[Interview with Marash Mukhamediyevich Nurtazin, chairman of the Kazakh SSR Supreme Soviet Committee on Questions of Ecology and the Rational Use of Natural Resources, by journalism student A. Omarova: "The Ability To Keep One's Own House in Order"]

[Text] **Marash Mukhamediyevich Nurtazin is chairman of the Kazakh SSR Supreme Soviet Committee on Questions of Ecology and the Rational Use of Natural Resources. In his pre-election program, the chairman of the oblast strike committee, a recognized authority among the miners of Karaganda, emphasized questions on the ecology. And today the deputies have entrusted him and other members of parliament with that extremely complex sector of work. How shall we improve the quality of our lives? What can the Ecology Committee do and what is it doing now? How can we overcome the state of crisis in the use of natural resources in the republic? These were the topics of our conversation with M. M. Nurtazin.**

[Omarova] What sort of guidance does the committee receive in its work, and how was it formed? Many deputies, even those whose campaign promises to the voters included the ecology, did not want to serve on the committee (There is no end of work, and it is a completely new matter). It is as if only the enthusiasts are willing to try...

[Nurtazin] Considering the new functions and the peculiarities of the work it faces, the committee was formed on the principle of voluntarism. This approach turned out to be the correct one—directors of major enterprises, gorispolkom [city soviet executive committee] chairmen,

academicians and workers have joined the committee. We understand one another extremely well.

Academician Sh. Yesenov took upon himself a great deal of work. Any member of the Supreme Soviet may consult with him on the widest range of questions. One can say that he is rendering great assistance in establishing us as specialists: people who previously did not know, in essence, just what ecology is, but who are now learning its fundamentals

[Omarova] And so what we have is a melding of science and production, theory and practice?

[Nurtazin] It is only the beginning of in-depth mastery of the problems, and a search for new approaches and solutions.

[Omarova] Exactly what have you contributed to the basic work of the committee from your pre-election program?

[Nurtazin] Well, that is not comparable; it is like the relationship of the parts to the whole. When the committee was formed, we thoroughly analyzed the entire mass of problems, and carefully considered all the situations which have come to pass in the republic and its environs in recent years. And we have come to the conclusion that the existing environmental protection system, and unified state control in the form of Goskompriroda [State Environmental Protection Committee], are clearly in conflict with the practice of the use of natural resources. The agencies and ministries have given local Goskompriroda committees only insignificant monitoring functions, and have kept the rest for themselves. And therefore, as before, they dictate the conditions and still do. Contrary to all logic and biospheric concepts, the nation's living natural resources have been divided into parts. For many years, one agency was responsible for the animal world, for example; another was concerned with forestry; and a third kept track of fishery development. None of them was accountable to the other. It is also paradoxical that the present-day Goskompriroda structure is situated within that very same structure of executive power which is, as before, the ruin of our ecology, and which this Goskompriroda is supposed to monitor. At the present time departmental interests have taken the high ground.

[Omarova] As long as such subordination is preserved, departmental independence will remain. What is needed in order for all these organizations to act together, and direct their efforts toward preserving the republic's ecological resources?

[Nurtazin] In our proposals to the Council of Ministers and during the just-completed sessions, we presented justification for the necessity of placing Goskompriroda directly under the Supreme Soviet, rather than the Council of Ministers. Moreover, the President of the republic himself, in one of his speeches, spoke of the fact that the monitoring functions of the ministries would be taken away and transferred to Goskompriroda. I hope

that the promises will be fulfilled, for our future depends on it. Otherwise all the committee's monitoring functions will become useless. Our proposal has not yet found the support of the deputies, but we believe that sooner or later it will be adopted, since it is dictated by life itself. We must act in time.

(Incidentally, this proposal is supported by Academician V. Sokolov, academician-secretary of the General Biology Department of the USSR Academy of Sciences and chairman of the Soviet Committee under the UNESCO Committee "Man and the Biosphere"—A.O.)

[Omarova] Marash Mukhamediyevich, what are the priority directions in the committee's work?

[Nurtazin] But of course—the major ecological problems in the republic: prohibiting nuclear detonations at the Semipalatinsk Test Range, and restoring the health of the Aral Sea and Lake Balkhash areas. But the most important, taken as a whole, is eliminating the consequences of the activities of the military-industrial complex on our territories, and in-depth conversion of its enterprises as a whole. We laid the foundation in Article XI of the Declaration on the Sovereignty of the Republic, on which we can now rely as a legislative act when drawing up resolutions and decrees.

[Omarova] Article XI was adopted, thanks to the steadfastness of the members of your committee...

[Nurtazin] As committee chairman, I introduced the basic features of the article, but the entire committee worked on it. And I would note that it was not steadfastness, but the fact that every deputy understood the significance of the ecological problems that "saved" the article.

[Omarova] To what degree does the corps of deputies comprehend these concerns and understand the fact that the ecology is not simply a most important sphere of activity, but also the basis for solving the republic's social and economic programs?

[Nurtazin] I would not say that at the present time the entire corps of deputies has delved deeply into the economic concerns, because the first attempt to subordinate Goskompriroda with all its functions to the Supreme Soviet went down in defeat; although I would say that the prestige of the President of the republic played a certain role here, for he was able to prove that it is still too early to speak about this. But I stand firm upon my own opinion: the ecological situation in the republic demands this. They still relate the ecology to a type of housekeeping function. That is in principle incorrect. The stereotypes of natural resource usage must be overcome.

[Omarova] We began to speak about banning nuclear detonations at the Semipalatinsk Test Range; nevertheless, nuclear detonations continue, as evidenced by the latest—at Novaya Zemlya last year. Does the idea of

demilitarization not lie at the basis of the work of the Committee on the Ecology? It is no secret that the military-industrial complex occupies a vast amount of territory in Kazakhstan; and, the military has no intention of giving up their positions. What is the committee doing to resolve this problem?

[Nurtazin] We act only by means of legislation. On the basis of Article XI of the Declaration on the Sovereignty of the Republic we may adopt any legislative acts whatsoever with respect to the VPK [Voenno-Promyshlenny Kompleks (Military-Industrial Complex)]. A resolution was adopted on prohibiting detonations on the Semipalatinsk Test Range and on the entire territory of the republic as well. This resolution was published in the press. I think that with respect to the military-industrial complex, we will also introduce a resolution declaring that the acts on transferring our land to the use of the VPK are void. We must conclude agreements on conditions which are advantageous to the people. Those 20 million hectares which are now reserved for the VPK are causing too much damage to the republic's ecological resources and to its economy.

[Omarova] Marash Mukhamediyevich, but are there documents which legally reserve these lands for the use of the VPK?

[Nurtazin] The fact of the matter is, that we have not yet found any documents whatsoever supporting this. Even for Semipalatinsk. On the whole, all this was done illegally and carefully hidden from the people who live here.

[Omarova] And as a result, the public suffers...

[Nurtazin] Not only the people, but also the republic's ecology and economy. They say that the law has no retroactive power. At one time these lands were given to the VPK gratis. But I think that, after consulting the legal experts, we will find the means to make recompense for the economic damage. For example, the city of Kurchatov-21, with its industrial potential and developed infrastructure must be transferred to Semipalatinsk Oblast; to the oblast, because it used to be a restricted zone, and has suffered the most economically.

Personally, I ask myself: why must we take payment only for leasing the land? I am thinking about Baykonur. After all, foreign monies are invested in every launch. Obviously the Union ought to transfer a share of the profits to the republic budget for resolving the ecological problems. In order to make this possible, it is necessary to adopt a number of resolutions, and we are working on them now.

[Omarova] One of the most acute problems urgently confronting you is the Aral Sea. How can the sea be resurrected, and returned to life? The Aral Sea is the ecological cradle of the Kazakhs; the roots of their culture are here.

[Nurtazin] The problem of the Aral sea has moved off dead center for the first time, this year. This year 700,000,000 rubles were received from the state budget for the Aral region, and were backed up by material resources as well. This is the first victory. And the fact that the question was brought up for examination by the USSR Supreme Soviet and that they have agreed at all levels of national and world leadership that this is a worldwide, global problem, provides the basis to presume that some success has been achieved. The problem of the Aral Sea must be resolved at the state level. One can, of course, divide it into three parts: the first—to save Man; the second—to save the ecology, both the environment and the lives of the people in the Aral basin; and the third, the restoration of the Aral itself as a living organism. The Aral Program is a long-term, very costly program. But we did not support the program proposed by the Government of the USSR, since in this program, the restoration of the Aral extends to the year 2062. I believe that we are obliged to restore the Aral over a period of 20-25 years, or else everything else loses its meaning. Apparently we should also chide our scientists, who to this day have not proposed a clear-cut concept for saving the Aral. It is proposed to announce a worldwide competition for the best plan for saving the Aral Sea, under the aegis of UNESCO.

If you want to speak about Lake Balkhash, the most important thing here is not to allow it to be poisoned—which is what we are working on.

The work of the committee is directed toward, starting in 1991, not allowing a single new enterprise to be put into operation on the territory of Kazakhstan without ecologically-sound technological policies, no matter how much it costs.

[Omarova] Marash Mukhamediyevich, are you not afraid that with the return to market relationships, the ecology will be left without assets?

[Nurtazin] I am. I have raised this question more than once at Supreme Soviet sessions and meetings. Therefore, I insist that Goskompriroda be removed from subordination to the Council of Ministers. After all, none of the economic programs envisage allocating monetary assets for the ecology. And under market conditions, enterprises and plants, institutions and organizations, having received complete independence, might begin such "activities," that it would take a long time to correct the mistakes.

[Omarova] Unquestionably, things will be complicated under the market. I think that many of us have forgotten the age-old meaning of the word "ecology," that in translation from the Greek it means—the ability to keep one's own house in order; to manage it. This meaning also defines the concept of—the economy; they have the same root: the eco-natural milieu of the lives of the people and the state...

[Nurtazin] Everyone understands all this in words, but in practice—alas. The most basic concept about which we

must think as legislators is: What shall we leave for our descendants? Our parliament must create the legislative-legal basis for preserving the milieu of life for the populace. Unfortunately, the "system" has imbued an entire generation of people with stereotypical thinking, which prevents them from properly appreciating the ecological situation. We need total ecological glasnost. Without that one cannot change a person. But when man himself changes, his attitude toward nature will change too.

[Omarova] We have come to the question of the role of the mass information media in the ecological education of the public. The republic EKO CURER [Ecology Courier] is already established. Marash Mukhamediyevich, are there any plans to publish a popular-scientific magazine which could become a rostrum for scientists and enthusiasts?

[Nurtazin] Yes, a newspaper will soon come to the readers. In time, a magazine will be founded also. Right now I cannot talk about that—there are no funds. We hope that the newspaper will to a certain extent help eliminate the information deficit, and bring about universal education. And here more active assistance from journalists is required.

[Omarova] How in general are the mass information media, radio and television illuminating the economic problems?

[Nurtazin] If I may speak frankly, our journalists more often than not approach it one-sidedly. Some of them, trying to earn a political reputation for themselves, seize upon the fashionable problems of ecology and foist off their own viewpoints, and not scientifically-based proposals. They ought to be more careful, and remember their responsibility. Who else can help us like the journalists can? After all, they are precisely the ones who possess the splendid opportunity, by propagandizing (Forgive me for using such a word with respect to the ecology) ecological knowledge and inculcating ecological culture among the people, thereby raising ecological consciousness. From hence it is not far to action. The press, television and radio are the forces on which the deputies must rely, in directing the ecological movement in the republic.

Mission of Uzbek Environmental Protection Committee Outlined

91WN03284 Tashkent PRAVDA VOSTOKA in Russian
5 Feb 91 p 2

[Press release from Uzbek SSR State Committee on Environmental Protection Press Center: "With the Right To Ban"]

[Text] Last December the Uzbek SSR Supreme Soviet approved a statute on the Uzbek SSR State Committee on Environmental Protection, which gives it new status!

Today, Uzbek Goskompriroda [State Committee on Environmental Protection] is directly subordinate to the

republic Supreme Soviet; that is, to the people's deputies, and it is guided by its decisions and laws and by the republic Constitution. Therefore, the committee's decrees, orders and instructions are binding on ministries and agencies, and state and other enterprises on the territory of the republic, for execution. At the very same time, UzSSR Goskompriroda does not supplant the ministries, agencies, institutions and organizations in their actions on protection and rational use of natural resources. They are only obliged to coordinate their activities with UzSSR Goskompriroda.

The republic Supreme Soviet has given UzSSR Goskompriroda the following basic tasks: restoration of the health of the ecological situation in the republic, along with preservation and rational use of natural resources—the land, sub-surface and surface water, the ambient atmosphere, and the plant and animal worlds. The state committee exercises comprehensive control of environmental protection activities, develops and approves republic, industrial branch, and departmental ecological normatives, rules and standards on protection and rational use of natural resources, monitors environmental pollution, and formulates and manages their funds. In addition, the committee conducts independent state ecological impact assessments of the general plans

for development and siting of industrial forces and branches of the national economy, and territorial plans for environmental protection; and, it is a voting member of the commission for acceptance and operational start-up of new or rebuilt projects, which have an effect on the environment.

UzSSR Goskompriroda has been given the right to attend hearings before the collegium during testimony by the ministerial leadership on their environmental protection activities, and the right to uninhibited inspection of any national-economic projects in the republic at any time of day or night. UzSSR Goskompriroda has the right to impose bans on planning and construction, reconstruction or expansion of industrial or other projects, conducted in violation of environmental protection legislation; it also has the right to stop the activity of industrial and other enterprises, enterprises and organizations which are in violation of the norms and rules of environmental protection.

In short, the Uzbek SSR State Committee on Environmental Protection has received a mandate from the Supreme Soviet, which permitted significant expansion of its rights.

REGIONAL AFFAIRS

EC Adopts Environment Projects

91.4N01404 Paris LA LETTRE EUROPEENNE DU PROGRES TECHNIQUE in French 20 Nov 90 p 9

[Article: "Review of Programs in Progress"]

[Text]

Science and Technology for Environmental Protection (STEP)

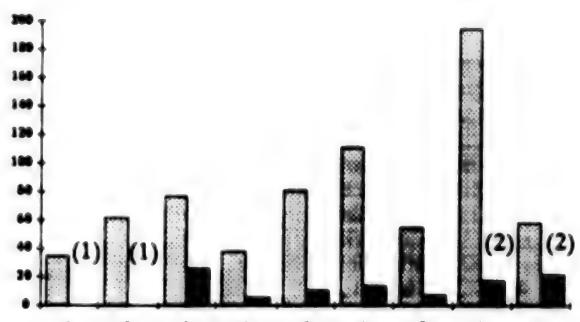
Here are the first results of the 1989 and 1990 calls for proposals. The EC Commission received 712 proposals for research projects totalling 792 million European currency units [ECU] in funding, corresponding to ECU539 million in requests for Community financing. These proposals involve 2,993 organizations, i.e., an average of three to four partners per project, bearing in mind that one organization might have participated in several proposals. Of these, 105 projects were accepted, representing a cost of ECU147.4 million.

The Community contribution to the selected projects amounts to ECU51.8 million. The preliminary budget allocation (Council decision of 8 December 1989) indicates that most requests for EC funding were made in area 8 (environmental protection technologies), at the expense of areas 3 (atmospheric conditions and air quality), 6 (ecosystems research), and 9 (major technological hazards).

European Program of Climatology and Natural Hazards (EPOCH)

Provisional results of the general call for proposals of August 1989 (with a deadline of 30 November 1989), the negotiations of which will continue until December 1990, show that the EC Commission has received 192 proposals for research projects totalling ECU232 million, representing ECU165 million in requests for Community financing. The proposals involve 913 organizations, i.e., an average of four to five partners per project.

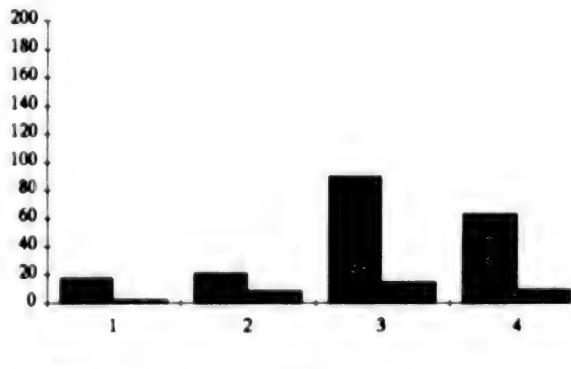
Thirty-seven projects have so far been selected, representing an overall cost of ECU87.5 million. The Community contribution is now ECU35.4 million. The preliminary budget allocation (Council decision of 8 December 1989) indicates that demand is higher in areas 3 (climatic effects and hazards) and 4 (seismic hazards) than in areas 1 and 2.



■ Number of applications
■ Number of selected projects

Research areas: 1) Former climates and climatic change;—2) Climatic phenomena and models;—3) Climatic effects and hazards;—4) Seismic hazards.

Key: (1) Evaluation in progress;—(2) Decision on financing of some proposals is still pending. Research areas: 1) Environment and human health;—2) Evaluation of hazards associated with chemical products;—3) Atmospheric conditions and air quality;—4) Water quality;—5) Protection of soil and subterranean water;—6) Ecosystems research;—7) Protection and conservation of European culture;—8) Environmental protection technology;—9) Major technological hazards.



■ Number of applications
■ Number of selected projects

Research Areas: 1) Former climates and climates and climatic change;—2) Climatic Phenomena and models;—3) Climatic effects and hazards;—4) Seismia hazards

Nordics Join in Hazardous Waste Project

*91W N0310A Stockholm DAGENS NYHETER
in Swedish 8 Mar 91 p 7*

[Article by Thorsten Engman: "Ready for Nordic Waste Management"]

[Text] A broad-based joint Nordic effort to dispose of and break down environmentally hazardous waste will become a reality over the next few years.

Since Norway and Sweden reached agreement in principle on how both countries' hazardous wastes should be disposed of last Thursday, Finland has also expressed great interest in participating in the joint effort.

"Finland has shown great interest in joining a common Nordic effort," says Riksdag member Per-Olof Hakansson, who served as the government's negotiator in the new Swedo-Norwegian agreement. "The fact that Finland now wants to be included means that we can coordinate our resources very well. We will certainly have to transport hazardous waste products over national borders, but we know that they will be disposed of in the best conceivable fashion, and that the Nordic environment will benefit in the long run."

Joint Company

"The manner in which the Finns will become involved is one of the issues facing the disposal company which Sweden and Norway will form," according to Per-Olof Hakansson.

The proposal presented by the officials to their respective governments contains a number of variants outlining the manner in which this cooperation could be managed in practical terms. According to the main proposal, a joint company would be established, with the Swedish and Norwegian Governments holding 30 and 25 percent ownership respectively, while trade and industry interests in the two countries would divide the remaining 45 percent. Sakab would represent the Swedish side where trade and industry are part owners through a foundation. It is hoped that the Norwegian side would be represented by Norsk Hydro and Statoil as part owners, among others. The company will require startup share capital of 20 million kronor, with an investment of an additional 300-400 million over the next few years.

Norwegian Plant

One of the first tasks facing the company would be the construction of a destruction plant somewhere in Norway. Among the sites under consideration are Halden, Dombas, and Gjerstad, south of Oslo.

"The site of the new plant is exclusively a Norwegian issue, and there was consequently no reason to bring it up in discussions of the initial framing agreement," said Per-Olof Hakansson.

In order to achieve the greatest possible level of specialized knowledge, it has been proposed that the Norwegian plant initially handle all burnable substances—organic waste—while Sweden will handle the chemical waste with the existing plant at Kumla.

If the government is to be able to put a proposition concerning the new plant before the spring session of the Riksdag, then work on the committee and departmental levels must be completed before the end of March.

BELGIUM

Wallonia To Invest in Waste Treatment Program

*91AN0251A Newbury BENELUX ALERT in English
13 Feb 91 p 21*

[Abstract of article published in Brussels L'ECHO DE LA BOURSE in French 4 February 1991 p 4: "Belgium—Wallonia Authority Approves Waste Treatment Project"]

[Text] Belgium's Wallonia regional authority has approved a 25-billion-Belgium-franc (BFr) 10-year investment plan, of which BFr5 billion will be invested in 1991, into waste treatment facilities in the region. The money needed for the investment will be raised by taxes on industrial and household waste. Under the plan, BFr6.5 billion will be spent on preventing the build-up of waste, such as by treatment at source; BFr7 billion will be invested in recycling; BFr7.7 billion will go towards treating household waste; BFr2.8 billion to treat special waste; BFr1.2 billion will be spent on a public awareness campaign; and BFr800 million on administration to implement the investment programme via the creation of a Public Company for Environmental Quality Enhancement (SPAGUE) and via the Walloon Waste Office.

DENMARK

Minister Backs Tougher Environment Laws

*91WN0281A Copenhagen BERLINGSKE TIDENDE
in Danish 20 Feb 91 p 1*

[Article by Terkel Svensson: "Minister Backs Harsher Punishment in Environment Cases"]

[Text] Minister of Justice Hans Engell recommends that elected officials and legal professionals be reeducated and given specialized training with regard to cases dealing with the environment.

In addition, he is prepared to negotiate for harsher fines and sanctions against environmental violations. Environmental violation cases will be litigated more quickly and more effectively in a closer cooperation between the police and the prosecuting authorities and environmental authorities. This is the goal of a series of new

administrative regulations to be enacted by Justice Minister Hans Engell (Conservative) effective 1 July of this year. He also says that he is prepared to spend this spring promoting harsher fines and sanctions. "Environmental cases get farmed out to the nine public prosecutors that we have, because it is necessary to have an equally distributed expertise in environmental cases all over the country," said Hans Engell.

This is why he has abandoned his goals of establishing a separate public prosecuting office for environmental cases and of assigning the environmental cases to a single public prosecutor. The new regulations, which will be negotiated with the attorney general and the Environmental Board, are organized into an eleven-point plan, of which some of the main elements are as follows: Elected officials and legal professionals should be re-educated and given specialized training in environmental cases; regional seminars will be established for police, prosecuting authorities and environmental authorities, so as to better coordinate environmental violation cases. The police will be given more opportunities to receive legal assistance during investigations and during the subsequent litigation involved in more large-scale environmental cases. In more complex cases, a lawyer for the defense will be brought in early on, and intervals of time will be established for the delivery of rebuttal responses from the defense attorney, so that the cases do not drag on. The responsibility for the submission of environmental violation cases to the public attorneys and the Environmental Board will be expanded, and the police will be given the general responsibility of orienting the public attorneys about cases which cannot be brought to conclusion within one year. Hans Engell says that the timely obtaining of watertight evidence has previously been a problem. In the future we are assured that cases will proceed on a "substantiated, manageable, and watertight basis," including accurate measurements.

FRANCE

Earthworm Method for Garbage Disposal

91WN0311A Paris LIBERATION in French
5 Mar 91 p 41

[Article by Frederic Bourgade: "Earthworm a Garbage Devourer With a Great Future"—first paragraph is LIBERATION introduction]

[Text] This autumn a firm in Montelimar will start letting earthworms ingest 10,000 metric tons of household refuse in Ardeche. And it will market the worms' excrement, which is an excellent compost.

Montelimar—Every year we produce 20.5 metric tons of household refuse, and elected officials do not always know what to do with it. The smallest project for a garbage dump causes a general outcry by neighboring residents and environmental organizations. A firm in Montelimar has found a solution that reconciles ecology with industry and should enable communes to save

money. Sovadec employs the Eisenia andrei, a voracious earthworm that wallows in our garbage and whose excrement makes an excellent compost.

The first unit to utilize earthworms is now under construction in La Voulte (Ardeche), and beginning this fall, it will be operational and capable of processing 10,000 metric tons of garbage collected in 12 communes. "We were forced into this choice more or less by circumstances," admits Claude Lareal, La Voulte's mayor. "We had a garbage dump that the prefect wanted to close because it was not up to standard. We could have opened another one somewhere else, but that would only have delayed a real solution. And based on the industrialization of the process and Professor Bouche's explanations concerning his earthworms, I was convinced," the Ardeche official explains.

The worm was discovered in 1972 by Prof. Marcel Bouche, a world expert on earthworms and director of research for the CNRS [National Center for Scientific Research] at the INRA (National Agronomic Research Institute) in Montpellier. He knows everything about earthworms: their names, numbers, habits, methods of reproduction, living conditions, and so on. He has now devoted 25 years of his life to them. After four years of observation, the professor concluded that this earthworm, which devours putrescible matter, was socially useful. But his scientific work did not lead to any specific application and was forgotten. Denis Chauffinand, the employee of a family-owned garbage collection company, exhumed the records and had enough faith in them to establish a company known as Sovadec to invest in the method and conduct full-scale experiments with it.

In three years' time, he spent 7 million francs [Fr] perfecting machines to select refuse, conducting technical studies to validate Prof. Bouche's observations, and testing those compost-making earthworms in two Ardeche communes. The hoped-for results were confirmed. The little creature performs wonders. "It is a surface worm that can live in mountains of refuse under certain conditions of dampness and constant heat (from 25 to 30 degrees Celsius for optimum performance)," Denis Chauffinand explains. "The earthworm lives for 1,000 days, reproduces very quickly at the rate of one worm per day, and works through the refuse in from six to eight weeks. It ingests organic matter—that is, newspapers, cardboard, vegetable peelings, and anything putrescible—which constitutes roughly 55 percent of what is in our garbage cans, and expels droppings in a very rich pile that is useful to agriculture."

The remaining 45 percent consists of plastic, heavy metals, scrap iron, and glass. Those materials are sorted beforehand and sent to the traditional centers for recycling or disposal. The process is carried on in a sealed environment and—theoretically—causes no pollution: no foul smells from garbage dumps, no methane gas, no rubbish carried about on the wind, and no visual nuisance.

The unit in La Voulte in Ardeche will be the first plant to be set up in France. It will serve as Sovadec's commercial showcase. The city has already made two hectares available and is bearing the financial risk (Fr12 million). The 12 communes making up Sivom [expansion not given] have signed a contract promising to pay Fr150 per metric ton of refuse processed. That is twice as expensive as burying refuse in a dump but slightly cheaper than incineration. Above all, the earthworm solution has the advantage of turning refuse to good account. Of the 10,000 metric tons of refuse processed, the company will extract 3,000 metric tons of compost which Sovadec guarantees will be marketed by a company it has just bought.

The process has a fine future. Following La Voulte, Deauville is already interested, and 45 departments [administrative subdivisions] have asked for information. Sovadec is also being approached by about 15 countries, among them Switzerland, Belgium, Finland, and even Haiti. "In that country, much charcoal has been burned, and the soils have suffered terribly. Processing household refuse and recovering compost may help them restore the soil," Claude Barratier, Sovadec's sales manager, explains.

GERMANY

Environment Minister Mandates Stringent Antipollution Standards

91P60123.4 Frankfurt/Main FRANKFURTER ZEITUNG/BLICK DURCH DIE WIRTSCHAFT 4 in German Mar 91 p 10

[Text] Against the backdrop of increasing automobile traffic and the increasing importance of the Federal Republic as a transit country, Federal Environment Minister Klaus Toepfer has put forth a 10-point catalog of requirements for an environmentally friendly automobile. This move includes a drastic increase in the stringency of exhaust standards, especially for trucks, a critical cut in fuel consumption down to an average of five liters through the year 2005, and a repurchase requirement for old automobiles.

Toepfer criticized that automobile manufacturers and importers are still refusing to institute a repurchase system that goes beyond the framework of public refuse collection. Instead, they're pleading for mandatory turn-in in which a [vehicle's] most recent owner need only take his vehicle off the roads, once he has presented a certificate indicating subsequent disposal of the vehicle. In the short term, if the economy presents no suitable proposal, the minister reportedly wants to compel the economy, by decree, to accept the repurchase policy.

In the interest of the communities, Toepfer announced another decree whereby the communities could undertake limitation of vehicular traffic when certain levels of air pollution are attained. In 1996, the exhaust levels, established for automobiles in December 1990 by the EC

Environmental Council and achievable only through the use of a three-way catalytic converter, will be decreased even further, in a second phase.

The emission of hydrocarbons and nitrogen oxides by gasoline-powered automobiles is to be cut in half. According to Toepfer's catalog of requirements, this also holds for soot particles in diesel-powered vehicles. Even sooner, the sulfur content in diesel fuel is to be reduced from 0.2 to 0.05 percent by weight. The benzene content of gasoline is to be reduced from five to one percent. From 1993 onward, for the first time, there should also be soot particle levels for cargo vehicles throughout the EC.

As an alarm signal, Toepfer estimates that, according to a study by the Heidelberg Institute for Energy and Environmental Research, the emission of the greenhouse gas carbon dioxide through the year 2000 will not decrease in light of the increase in [vehicular] traffic, but rather will increase by 26 percent. His goal remains the reduction of overall carbon dioxide emissions by 25 percent by that time. He expects an equal [reduction] on the part of other producers of carbon dioxide, such as power generating stations, industrial combustion and home heating.

Wismuth Radioactive Waste Removal Costs DM830 Million

AU2803104591 Cologne Deutschlandfunk Network in German 1000 GMT 28 Mar 91

[Text] This year alone, the removal of the waste caused by the Soviet-German joint stock company, Wismuth, costs 830 million German marks. As the Federal Government reported in answer to a question from the Alliance 90/Greens group in parliament, this amount is above all intended for the disposal of the nuclear waste of the open uranium mines, in order to avoid the contamination of the ground water. Before the end of the year, the dismantling of the installations and the demolition of radioactively contaminated buildings will also be initiated, it was stated.

Cross-Linked Polyurethanes Recycled

91AN0131A Toddington NEW MATERIALS INTERNATIONAL in English Nov 90 p 3

[Text] Bayer has developed a process for recycling cross-linked polyurethanes in production waste, reject mouldings, and damaged car body parts.

The company's specialists are confident that the strength values of the recycled parts will allow several application areas—in automotive for example wheel arch linings, panelling for chassis members, and battery covers. Several car manufacturers are believed to be interested in the project.

Compared with original parts, Bayer claims tensile strength of mouldings produced by the recycling process is some 50 percent lower, with elongation reduced to about 15 percent.

Until now it was considered technically impractical or even impossible to thermoform cross-linked plastics because of their inability to soften or fuse when heated.

The process uses high pressure and temperatures of around 180 degrees Celsius. The waste materials are granulated, preheated, and then filled into a heated mould. The granules flow together and bond in the mould, but without melting like true thermoplastics. Known as thermopressing or flow-pressing, the process could be described as a cross between fusing and sintering.

Current development work at Bayer is aimed at improving the properties of the recycled parts by optimising processing parameters and varying the basic chemical principles of the process.

Cologne University Develops Recycling Process for Varnish Sludge

91M101704 Wuerzburg UMWELTMAGAZIN
in German Dec 90 p 53

[Text] Varnish sludge accounts for a considerable share (around 200,000 tonnes annually) of overall special waste in Germany. For many years varnish sludge has been either dumped or incinerated. Cologne University is working on material recycling as part of a project funded by the Federal Ministry of Research and Technology (BMFT) and scheduled for completion by mid-1991. According to interim results, variations in the composition of varnish sludge mean that there can be no universal recycling method and that different processes have to be applied.

Until now, around 80 percent of varnish sludge was dumped, especially by the automobile industry. However, since the technical committee on waste became operative, it can no longer do so. In addition to dumping, varnish sludge is also incinerated. As it has a relatively high energy content, varnish sludge can be used as alternative fuel. However, it also contains heavy metals and, in some cases, high levels of chlorinated solvents, which make flue gas dust filtering indispensable, a tiresome and expensive procedure costing up to about 1,000 German marks [DM] per tonne and becoming increasingly costly.

A provisional report by Cologne University makes it clear that the most useful varnish sludge components are the binding agents used for recycling purposes (resins) and pigments. Different processes will be used together in future to extract them.

As far as pigments are concerned, only TiO_2 is worth recycling so far. A process developed by the university uses conventional fluidized-bed combustion to incinerate varnish sludge. Multistage flotation extracts a TiO_2

concentrate from the ashes, and this can be processed to obtain an extremely pure TiO_2 pigment. A cost analysis has shown that varnish sludge incineration and the costly flue gas filtering that it requires account for the major share of processing costs, thus making it difficult to assess the economic viability of the recycling process.

Another newly developed process uses hydrolysis to break down the binding agents in varnish sludge. A thermal separating system decomposes the resulting monomeric conglomerate into individual monomers, which are a valuable raw material for the chemical industry. However, processing costs are so high (about DM1,300 per tonne) that this procedure is not yet economically viable.

A third potential method of recycling that Cologne University is assessing, and which is currently being tested in an experimental plant, is the targeted separation of the binding agents. At present, research focuses mainly on the development of an economically viable separation process, which would have the advantage of recovering the binding agents, most of which are in pure form, for reuse in new varnishes or for the production of molded parts and insulating matting. So far, tests have been encouraging. The university hopes to be able to publish its conclusive findings next spring.

BASF Uses Ceramic Catalyzer for Exhaust Gas Purification

91P60114 Frankfurt/Main FRANKFURTER
ZEITUNG/BLICK DURCH DIE WIRTSCHAFT
in German 12 Feb 91 p 8

[Excerpts] BASF AG has equipped one of its Ludwigshafen power generation stations with a ceramic catalytic device for removing nitrogen oxide from exhaust gases (passage omitted). The device's primary building materials include titanium dioxide, vanadium pentoxide and tungsten oxide. The individual elements of this ceramic catalyzer are honeycomb-shaped, having an internal wall thickness of 1 mm and an external wall thickness of 1.8 mm. Each element measures 15 cm x 15 cm x 1.10 m. These elements are grouped into modules and arranged in a reactor on three separate levels. Each of the catalyzer's nearly 60 m-high reactors contains 10,800 individual elements. Exhaust gases, at a temperature of 330 degrees Celsius, are passed through the honeycomb structure where they are mixed with ammonia. This chemical combination transforms the nitrogen oxide in the exhaust gases into nitrogen gas and water vapor. The exhaust gases are then channeled to an intermediate dust filter and then on to a desulfurization unit where sulfur is washed out using the Wellman-Lord process which has the advantage of not precipitating gypsum (passage omitted). At the end of the reaction, sulfur dioxide is recovered in concentrated form and can be applied in other chemical processes [passage omitted]. Although the catalyzer is expensive and requires 7 percent of the installed power of the power generating station, it has yielded BASF's best exhaust gas purification results to date [passages omitted].

BMFT To Fund Air Pollution Research Projects

91M10197A Bonn TECHNOLOGIE-NACHRICHTEN
MANAGEMENT-INFORMATIONEN in German
18 Jan 91 p 4

[Announcement by the Federal Ministry of Research and Technology of Research and Development Project Subsidies Under the "Environment Research and Environment Technology" Funding Program Area: "Reduction in Volatile Organic Compounds (VOC's)," dated 20 December 1990]

[Text]

I. Funding Area

Within its Environment Research and Environment Technology program, the Federal Ministry of Research and Technology (BMFT) subsidizes research and development (R&D) projects on the reduction of volatile organic compounds emissions.

II. Problem Definition

Current air pollution in the FRG by volatile organic compounds is considerable. Attention had also been drawn to this fact in the Federal Government's Fourth Report to the German Bundestag on Protection Against Emissions. To keep this environmental hazard within bounds, new technical processes for pollutant reduction must be developed. R&D subsidy measures designed to reduce halogenous emissions were promulgated in the summer of 1989 and have meanwhile come into effect. They will now be extended to cover nonhalogenous organic compounds. In addition to other toxicologically dangerous compounds with heteroatoms, this specifically involves the following groups of substances:

- Aliphatic and, more particularly, aromatic hydrocarbons.
- Glycol ethers and glycol esters;
- Ketones, and in particular cyclohexanone.

These substances, along with others, are primarily used as solvents for enameling, printing, and bonding. It is expected that consumption, which in 1982 still amounted to 470,000 tonnes per annum, can be more than halved by 1995 by applying methods that have since become available, and to an even greater degree through processes yet to be developed.

In enameling, this goal can primarily be achieved by further developing environment-friendly coating systems, such as powder enameling and electron-beam hardening systems. Existing coating technologies can avoid primary VOC's by improving coating efficiency or, in other words, by optimizing the coating process. In particular, this requires studies of wood coating and the optimization of enamel spray guns. As for printing and bonding, ecologically harmless solvents or entirely different processes should be used instead of those containing VOC's.

Wherever VOC emissions can be avoided, secondary or structural measures such as encapsulation, exhaust-air purification, closed circuits, and improved residue processing must be adopted to prevent VOC's from escaping into the environment.

These pollutant reduction methods cannot be introduced unless improvements are achieved in metering and analysis techniques. Measuring and monitoring volatile organic pollutants, especially those released by small-scale emitters, requires selective, rapid, reliable, reasonably priced measuring processes. These in turn require progress in sensory analysis, as do the emission-reducing process control systems, not enough of which have been available to date.

III. Funding Criteria

Within the limits of the available resources, funding will be granted for projects that make it possible to dispense with organic solvents or at least to achieve a drastic reduction in "VOC emissions." Associated measuring processes are included.

Applications are eligible for funding if:

- they relate to representative fields of application and there appears to be a guarantee that the results will be transferable (model function);
- they involve new and/or substantially improved processes and concepts;
- the projects concerned entail considerable technical or scientific and/or economic risk of failure.

The BMFT's general conditions for approval will be applicable. There is no legal right to the grant of a subsidy.

Additional information may be obtained from:

German Aerospace Research Institute (DLR)

Environment Protection Technology Project Manager (PT-UsT)

Suedstrasse 125

5300 Bonn 2

Tel. 0228/3821-0

Prior to filing a formal application, applicants are advised to set out their ideas for research under the funding program described above in a project outline and to discuss it with the project manager. If there are good prospects of a subsidy, the project manager will issue the requisite application forms and guidelines.

Bonn, 20 December 1990

523-7274-328/90

The Federal Minister of Research and Technology

by order

Dr. Schoett

BMFT Funds Environment-Related Research Projects

91M102144 Bonn TECHNOLOGIE-NACHRICHTEN MANAGEMENT-INFORMATIONEN in German
29 Jan 91 p 3

[BMFT announcement of funding for research and development projects under the special "Environment Research and Environmental Technology" and "Renewable Raw Materials" funding programs in the "Rapidly Biodegradable Lubricants" funding area, dated 12 December 1990]

[Text]

I. Funding Areas

According to their respective targets, research and development (R&D) projects on "Rapidly Biodegradable Lubricants" may be funded under the following BMFT [Federal Ministry of Research and Technology] programs:

- Environment Research and Environmental Technology, because rapidly biodegradable lubricants may be expected to help reduce emissions of toxic and water- and soil-polluting organic substances;
- Renewable Raw Materials, because the use of natural raw materials for lubricants could create a market for agricultural products in the nonfood sector.

II. Introduction

Mineral lubricants are of central importance to technology. The high efficiency of present-day technical plants and machines could not have been achieved without the high-grade lubricants, separating agents, coolants, and hydraulic fluids that are now available. But the production, use, and disposal of mineral lubricants also causes environmental pollution, which is attracting an increasing amount of criticism with the growth in environmental consciousness.

In 1989, western Germany used 1.1 million tonnes of lubricant, about half of which was recovered as waste oil, while the other half was either consumed or discarded during use. It may be assumed that a considerable proportion of the latter found its way into the environment. The substitution of rapidly biodegradable lubricants for their mineral counterparts could represent an opportunity to reduce this environmental pollution.

The substances involved are liquids consisting of natural esters (vegetable oils), synthetic esters, or polyglycol ethers that can be used as basic oils for lubricants. Whether it is possible and reasonable to introduce them largely depends on their environmental compatibility and whether their tribological properties and economic viability are comparable with those of mineral lubricants. If vegetable oils can be more widely used, the cultivation of renewable raw materials will extend the farming sector's market potential.

III. Problem Definition

Environmental pollution by mineral lubricants must be reduced. To achieve this, the environmental relief potential of rapidly biodegradable lubricants, preferably vegetable-based, must be exploited.

This applies to:

- open tribosystems and/or lubrication systems involving loss (e.g., lubrication of points, oil mist lubrication systems);
- medium- or low-pollution mobile tribosystems (e.g., the transport, agricultural, and building sectors);
- tribosystems with higher loss rates (e.g., in the steel sector);
- low-pollution tribosystems.

However, finding replacements requires extensive R&D work on topics ranging from the biotechnological development of appropriate vegetable oils to the toxicological study of new additive systems, from questions regarding the material compatibility and structural layout of the tribosystems to disposal. This primarily involves the following fields:

- breeding of new oil plants to optimize vegetable oils for use as lubricants;
- oleochemical processes for preparing basic oils for lubricant applications;
- development and testing of new environmentally compatible, highly effective additives, especially agents for lowering the sensitivity of vegetable oils to oxidation and hydrolysis;
- development of analytical test methods to establish the biodegradability of basic oils and additives in field conditions;
- lubricant testing for biodegradability and toxicity in soil, watercourses, sewage treatment plants, etc., in field conditions;
- optimization of tribosystem lubricants, materials and structural layout;
- operational trials in routine use with a range of accumulated stresses under monitored operating conditions;
- development of disposal processes and concepts with a view to recycling the fluid base oils.

IV. Funding Criteria

Within the limits of the available budgetary resources, funding will be granted for R&D projects in the above fields, provided

- they relate to representative fields of application and there appears to be a guarantee that the results will be transferable (model function);
- they involve new and/or substantially improved processes and concepts;
- the projects concerned entail considerable technical or scientific and/or economic risk of failure.

The BMFT's general conditions for approval will be applicable. There is no legal right to the grant of a subsidy.

Additional information may be obtained from:

German Aerospace Research Institute (DLR) Environment Protection Technology Project Manager (PT-UsT)
Suedstrasse 125 5300 Bonn 2 Tel. 0228/3821-200 Fax 0228/3821-229

Prior to filing a formal application, applicants are advised to set out their ideas for research under the funding program described above in a project outline and to discuss it with the project manager. If there are good prospects of a subsidy, the project manager will issue the requisite application forms and guidelines.

Bonn, 12 December 1990

The Federal Minister of Research and Technology

by order

Dr. Schoett

GREECE

Difficulties in Toxic Waste Disposal

91WNO313A Athens 1 KATHIMERINI in Greek
28 Feb 91 p 6

[Article by Eleonora Tzefroni]

[Excerpts] More than 600,000 tons of dangerous solid waste are produced in our country every year, of which about 200,000 tons are toxic waste. Not only are the figures nightmarish. It is also the actual state of affairs that does not leave any margin for relaxation. Greece is one of the Mediterranean countries whose seas receive huge quantities of toxic waste. And not only the seas. The storing of toxic and industrial material takes place in fields, "landfills" and rivers. Often, some industries store waste in empty factory areas or in barrels. Even old quarries or mines "receive" industrial and toxic waste products. What is significant is that none of these places is suitable to receive these products.

Report

As mentioned in a report on toxic waste, issued by the Greek section of the international "Mediterranean S.O.S." 90-93 percent of the overall amount of dangerous toxic waste comes from 20 big industries and 300 of the 600 middle-sized and small plants that produce such waste.

In a recent Greek report to the European Community Committee on the handling of dangerous toxic waste, four tables are presented giving a picture of the prevailing situation in Greece. Specifically, in Attiki Nome, 192,955 tons of such waste and sludge are produced a year. 128,390 tons in the nomes of southern Greece and

the islands, 195,000 tons in Salonica Nome and 112,347 in the nomes of northern Greece. We mention some of these substances: Phosphogypsum, acid sludge from converted used mineral oil, lead-based sludge, sludge from paints and finishes, waste with traces of asbestos, enriched ferro-nickel dust, used catalysts, industrial fertilizer sludge, steel industry dust, etc. [passage omitted]

Very few waste processing installations operate in our country or waste is seldom recycled. The "Mediterranean S.O.S." report points out, "Often, the only and primary method for processing liquified waste is their disposal in the environment."

The report mentions that "years ago the Ministry of Environment, Planning, and Public Works had planned—but it did not move forward on—the construction of two liquified toxic and dangerous waste product and sludge plants, one in Attiki and the other in Salonica. The plans are presently still in their beginning stage...."

ITALY

Environmental Monitoring System Developed

91MI0174.4 Rome ECOS in Italian Nov-Dec 90
pp 61-63

[Article by Laura Brunetti; Interview with Ivano Giovannini, head of the AMES project, by ECOS; place not specified: "On the Trail of Pollutants," first paragraph is ECOS introduction]

[Text] AMES (Advanced Monitoring Environmental System) is an innovative experimental project designed to measure pollution in large urban areas. It was inaugurated by ENI [National Hydrocarbons Corporation] in Milan on 11 September 1990. The project is funded under ENI's technological R&D fund and involves an estimated expenditure of approximately seven billion lire over three years.

Five ENI group companies, Snamprogetti (project coordinator), Enidata, Eniricerche, Nuovo Pignone, and AgipPetroli are working on the project.

We spoke with project leader Ivano Giovannini of Snamprogetti.

ECOS: What induced ENI to develop the AMES project?

Giovannini: The desire to make an effective and innovative contribution to solving the problem of pollution in large urban areas.

We are all aware of the harmful effects of traffic, home heating, and some industrial processes. Therefore, strategies and measures designed to reduce the environmental impact of these sources of pollution to a minimum must be defined as soon as possible.

The difficulty in finding a solution is essentially due to the complex relationship between the sources of pollution and their locations.

ECOS: How does this project work?

Giovannini: The goal is to develop a prototype of an air monitoring system that can establish a link between pollutants and sources by using refined analytical and data processing techniques. This system is designed to overcome the static nature of current monitoring systems. Today, the monitoring of urban centers means taking snapshots of the situation to define the pollution levels at a specific time without providing any information on the causes or offering a possible solution. The AMES project aims to develop a system that can use the readings of a series of parameters relating to pollution and the structure of the territory, to identify the individual sources of active pollution in urban areas and optimize subsequent courses of action in terms of effectiveness and cost. The system can be used to simulate these measures to confirm their effectiveness in advance.

The three-year project (1989 to 1992) is composed of two parts. The first deals with the research and testing of monitoring methods and data processing; the second is more practical and involves developing the prototype of a monitoring system.

This prototype should become a new standard for monitoring systems and will later be marketed.

ECOS: Who are the potential buyers?

Giovannini: Primarily the public administration. This includes the provincial authorities who are institutionally entrusted with controlling pollution levels in their localities, as well as the municipal authorities, above all in metropolitan areas, who must take measures to control traffic circulation.

The system can also be used abroad, where nothing of the kind currently exists apart from a similar system developed in Los Angeles.

ECOS: Could you describe the AMES project in detail?

Giovannini: First, a research and experimental phase will take place in urban Milan. This area has an extremely rich "laboratory" of data and analyses since monitoring systems have operated there for over 20 years. This has undoubtedly facilitated our research.

The prototype, however, will be developed in Rome.

The first two years of research are subdivided into four targeted projects. The first project involves developing a system that can forecast concentrations of NO_2 and CO_2 .

The system is based on monitoring pollution and meteorological data. The Electronics Department of the Polytechnic of Milan is also working on the project.

The second project is to evaluate how the various sources contribute to pollution. The objective is to define unconventional methods and tools that will measure pollutants and to develop receptor models. In practice, this project involves taking the "fingerprints" of sources by measuring several specific pollutants that are typical of the sources themselves. Two mobile laboratories have been equipped to analyze the various types of hydrocarbons (about 70 have been identified) by correlating these to real traffic and heating conditions.

All this is being done with the help of research results obtained in the United States. The CNR's [National Research Council] Pollution Institute of Rome is also collaborating in the project.

These two initial projects are designed to verify what happens in the air and the final impact of the emissions. The third and fourth projects instead are designed to assess what these emissions are. As you can see, these two themes are interrelated.

The goal of the third project is to evaluate the characteristics of urban traffic. Models of traffic flows are therefore reconstructed by using a network that monitors circulation in urban areas. The Institute of Roads and Transport of the Polytechnic of Milan is collaborating in this project.

The fourth project is designed to develop factors and models to evaluate traffic and heating emissions.

The Institute of Medical Engineering of the Polytechnic of Milan is collaborating in this project together with Acinnova, an ACI [Automobile Club of Italy] research company, which deals with factors relating to traffic and traffic circulation.

The results of these four targeted projects will be transferred to the prototype of the technologically advanced monitoring system to be developed in Rome during the third year of the project.

ECOS: Each of the ENI group companies has a specific task in the AMES project. Can you summarize their roles?

Giovannini: As I have already mentioned, ENI came up with the idea of an environmental project. On the basis of this "input," each of the various companies then mobilized their own capabilities and experience to integrate themselves and offer the "top" technology available today.

Snamprogetti directs and coordinates the project through its ecology sector.

Eniricerche is involved in measuring the traces of components that characterize sources of pollution and in elaborating mathematical models to quantify the various amounts.

Enidata's role is to oversee the data processing aspects of the project, by developing the computer systems on the

basis of research results. This company produces the computer system that is behind the measuring instruments.

Nuovo Pignone develops the instruments as well as the mobile equipment and data transmission systems (coming from mobile or fixed roadway receptors) that reach the principal processing center via radio or via telephone cable.

AgipPetroli defines engine emissions during the various phases of traffic circulation and then sets the conditions to standardize automobile emissions in its laboratory.

Waste Disposal Problems Plague South

91WNO315A Rome L'ESPRESSO in Italian 3 Mar 91
pp 53-54, 56

[Article by Enrico Fontana and Carlo Gallucci: "A Double Swindle"—first paragraph is L'ESPRESSO introduction]

[Text] Pollution: Wastes produced by the industries of the North end up in Campania. There they enrich the Camorra and poison the land. Here are the background and the protagonists.

After drugs, illegal lotto, and fixed contracts, the latest discovery of organized crime is the illicit traffic of hazardous industrial waste. The incident, which became known last week, of the poisoning of Mario Tamburrino, the truck driver from Matera who lost his sight probably because of an accidental contact with the content of his truck, is only the last in a series of similar events. In the past, a similar incident in the Nocera area caused the death of two people. The greater risk, however, is not for the truck drivers, but for the inhabitants of the areas near the disposal sites—almost always unauthorized and uncontrolled—where the poisonous containers are illegally unloaded.

In spite of the health problems caused by the contamination of underground waters that eventually end up in the reservoirs, in Campania illegal disposal sites are almost never reported. In these cases, too, the Camorra controls the situation through its conspiracy of silence.

Therefore, a gloomy caravan of trucks has developed which daily transports the waste produced by the rich industries of the North to the South, especially to Campania. One of the most important confirmation of these fears is coming from the investigations begun by the State Forestry Department.

The first signs date back to a year ago, when, suddenly, the market price for the disposal of a kg of industrial waste went down 50 per cent, from 700 to 1,000 lire per kg to 300 lire per kg.

A number of central and southern companies (presently under investigation by the Forestry Department) are supposed to be responsible for this decrease. They would dispose of the waste at very low prices, perhaps dumping

it in illegal disposal sites, such as is happening in Campania. Lately this phenomena seems to have reached sizable proportions. Preliminary estimates indicate that at least 1 million tons of waste per year is disposed by more or less illegal means.

Another official confirmation of waste "migration" comes from Rome. In the past few months, the Environment Ministry has collected a voluminous file on various disposal sites in the Naples area. The alarm, as L'ESPRESSO was able to confirm, was given during January and February of last year by an urgent telex sent by the office of the general manager of the Prevention and Pollution Department to the provincial administration of Naples. The telex requested "data related to the quantity and type of the wastes produced by ACNA of Cengio from January 1987 to today, that are shown in the loading and unloading records of the following companies: Giuliano (dump), Centro Smaltimento Sud, Di. Fra. Bi., and Vassallo."

To the preliminary data collected by the Ministry were added those given by the Ecology Office of the Province of Naples. It appears that during the past three years 22,000 tons of waste produced by the Cengio firm ended up in Campania; according to the shipping bills none of the waste was toxic or hazardous. The four disposal sites that supposedly took care of this waste are: Setri of Giuliano, Di. Fra. Bi. of Pianura, Vassallo, also of Giuliano, and the Centro Smaltimento Sud of Sant'Anastasia. According to documents in the hands of the investigators, the latter is the same company that supposedly handled the toxic waste that caused Tamburrino's loss of sight, and that a few days ago was found in an illegal disposal site in Qualiano, in the province of Naples.

In any case, the Sant'Anastasia company, located on the slopes of the Vesuvio, is not authorized to handle industrial waste. The Liberal Raffaele Perrone Capano, provincial chairman of Ecology, explains that in the entire province of Naples only two companies are authorized to handle this type of waste: Setri of Giuliano and Di. Fra. Bi. of Pianura. But Transfemar, the intermediary company that is the link between Ecomovil of Cuneo (the sender) and Centro Smaltimento Sud, claims to have the receipts.

This is not the first time that the Sant'Anastasia firm is involved in the North-South traffic of industrial waste. In the documents sent by the provincial administration of Naples to the Environmental Ministry about the ACNA case, Francesco De Simone, the sole manager of the company, claims "to have handled the final disposal of ACNA's waste in 1988." He is also quick to add, in the same document, that he is unable to supply other information because "the company was the victim of an unsolved theft." The theft was duly reported in August 1989 to the Carabinieri of Somma Vesuviana. In the report, attached to the declaration of the owner of the disposal site, are listed the contents of the stolen vehicle.

According to De Simone, the trunk contained "a typewriter, sale and purchase bills, delivery bills, loading and unloading records of special wastes, and a fax machine." And yet, according to the documents gathered by L'ESPRESSO, during the month of August 1988 alone, over 2,000 tons of waste produced by ACNA of Cengio and sent to Campania were disposed by Centro Smaltimento Sud.

The four Campania firms are involved in the ACNA case through the intermediation of various northern companies, such as Iresos, Chemiza of Milan, Bonetto of Turin, Finessi of Vittorio Collegno, also in the province of Turin, and Ekoground of Genoa. On 20 September 1988, the latter, together with Ecomovil of Cuneo, was implicated by a parliamentary investigation—requested by the Greens—in connection with the scandal of the ships carrying poison. And also in other occasion in the past, the name of the four Campania companies have come up from the entanglement of interest and business relations that characterize the business of industrial waste disposal. An article that will be published in the next edition of the aggressive Neapolitan monthly magazine LA VOCE DELLA CAMPANIA will describe the rise of the Vassallo family, owner of the disposal site of Schiavi Giugliano, in the province of Naples. The company, which began with small contracts from the comunes between Giugliano and Aversa, grew quite fast and in 1987 was able to acquire, in a competitive bid, the contract for the disposal of ACMA's waste: 527 tons gathered in only four months—from July to November 1987—though Cise of Somma Vesuviana. In the same year, however, the company encountered its first obstacle when a load of apples from orchards near the Vassallo incinerator was confiscated at the German border. Those apples contained too much dioxin. At the same time the contract with ACNA also ended. But during those same months the Cengio company's waste is disposed in the nearby disposal site of the Setri company in Giugliano: 1,500 tons of special muddy waste that in 1988 became 13,000 tons. Business is good. But the persons in charge of Setri, which is headed by the attorney Cipriano Chianese, defender of many Camorra members, are accused by the Finace Guards of a presumed tax evasion of 15 billion lire. Lately, the disposal site is managed by the Broscino brothers of Marigliano, owners of a transport company also specialized in industrial waste. It seems that the Broscinos, together with Chianese and the Vassallo company, took over the control of the Sessa Aurunca disposal site, in the province of Caserta, after the former owner, Antonio Buonamano, was sentenced to four months in jail last July for illegal disposal of toxic waste. The business of Setri risks now to collide with the other large company in this line of business, Di. Fra. Bi., owned by the La Marca brothers of Ottaviano, who recently entered the Caserta region to manage the San Marco Evangelista plant.

Often, however, it is not the owners of the disposal sites who make the best deal, but the truck drivers. They can charge for "legal" disposal and unload the poisonous

drums over a cliff or along the bed of a stream. The names of people in charge of two of these companies, Safin of Raffaele Fioravante Napolitano, and Agizza SpA of Vincenzo and Antonio Agizza, are included in the remand to trial of the Nuvoletta clan issued by judge Paolo Mancuso. Agizza SpA is now also authorized to transport hospital waste. And so for the first time the stamp of Camorra is on the ecology business.

Nuclear Energy Research Intensified

Nuclear Energy Committee

91M10178X ITALIA OGGI in Italian 10 Jan 91 p 33

[Interview with Professor Umberto Colombo, president of ENEA, by ITALIA OGGI; place not specified; first two paragraphs are ITALIA OGGI introduction]

[Text] Italy's energy bill is growing due to the Gulf crisis. While Italy acquires electricity and fuels abroad, safety technology for atomic reactors is being refined and new techniques for the treatment of fission waste are being developed. A consortium has recently been established (Ansaldo, Fiat, ABB) to develop a more intrinsically and passively safe reactor.

In light of these new elements, has the time come for Italy to talk over nuclear energy again? We asked Professor Umberto Colombo, president of ENEA (National Committee for the Research and Development of Nuclear and Alternative Energies), the institute which oversees energy research in Italy. In brief, Colombo proposes exploring the whole sector.

Three Recipes: Savings, Coal, and Natural Gas

Colombo: I believe that the Gulf crisis and the threat of future crises, the concern of the over heating of the Earth's atmosphere due to the greenhouse effect, and Italy's excessive dependence on imported energy, especially petroleum, will oblige us to adopt a well-defined energy strategy to recover from such a vulnerable situation. First, we must focus on saving energy by promoting less energy-intensive industrial production.

There should be a greater use of natural gas and carbon among the fossil fuels, so as not to produce more greenhouse gas than the current mix. We must also speed up the penetration of renewable energy sources, taking advantage of the high energy costs. Finally, nuclear research should be intensified. After the stall brought about by Chernobyl, this can return in Italy, with a new generation of reactors that can clearly be demonstrated as having a safe, reliable performance.

ITALIA OGGI: Mention has been made of "safe" or "safer" reactors for some time now. Two are currently under study in the United States. However, attention currently focuses on the Swedish PIUS [expansion not given] Professor Colombo, can this reactor be proposed to the general public?

Colombo: We have launched joint ventures (involving Italian industry) with General Electric and Westinghouse in the United States and with ABB Atom in Europe. The two American companies are developing a boiling water reactor, and the AP-600 pressurized water reactor respectively. Both are of medium size (600 MW), with extremely more simplified plants, and decidedly innovative solutions where safety is concerned.

ABB Atom is currently studying PIUS, which is a pressurized water reactor. This is an entirely new concept where safe operations are based on the reactor's inherent self-adjustment capacity without requiring active intervention systems. The distinguishing feature of the PIUS project is the immersion of the core and the entire primary circuit in a cold tank at the same pressure as the refrigerating circuit. This solution eliminates the problem of a breakdown in the primary circuit at the source. The reactor's emergency shut off is guaranteed by the spontaneous entry of borate water into the core which generally occurs in disturbed conditions of any kind. This element confers a high degree of intrinsic safety to the whole project.

The principle has met with the approval of scientists and the theoretical project has been judged worthy of development. However, it will be necessary to demonstrate that the reactor can work without too many stumbling-blocks. To prove this, a prototype must be built to demonstrate the plant's feasibility and working capability.

The International Energy Agency in Vienna is proposing smaller, passively safe reactors with containment dikes to block radioactive emissions (or leaks in irrelevant quantities as far as health is concerned) even in case of serious accidents, as the path toward "new nuclear energy."

Decrease Accidents, Avoid Evacuations

ITALIA OGGI: But is this the right path?

Colombo: On the one hand our approach aims to drastically reduce the risk of a serious accident occurring within the reactor by introducing simplified plant operations and a high degree of intrinsic and passive safety. On the other hand, we are trying to develop a containment system that can contain the radioactivity freed from the fuel within the reactor itself, even in case of serious accidents (including the fusion of the core). Outside, therefore, there would be no appreciable radioactive consequences at all. In other words, it would not be necessary to evacuate the population and the territory and agricultural products would not be contaminated. This last feature definitely represents the major safety goal that we wish to achieve with new nuclear technology, and it is a goal that holds particular importance in a country as densely populated as Italy.

ITALIA OGGI: In other words, has the time come to appeal for a new trial on nuclear energy?

Colombo: An immediate return to nuclear energy in Italy seems rather improbable. I do, however, emphasize the fact that whatever the political decision on present day power plants, our research focuses on new generation reactors. Within three years, the program now under way should enable us to choose the reactor model on which to concentrate our development efforts. The subsequent program, which can be formulated only hypothetically at present, could lead to the definition of a detailed plant project by 1996, and the development of the first in a series of power plants in the following six or seven years. After all a construction plan for new generation nuclear power plants in Italy could reasonably be launched at the beginning of the next century. The temporary outlook for fusion, however, is much further ahead than for new generation reactors. We feel that a commercially competitive prototype of a fusion reactor will be possible in the year 2040. This is a very long term goal but one that needs to be pursued with determination.

Research on soft energy, defining the rules for the use of fossil fuels, and more studies on sophisticated nuclear energy, without giving up the idea of creating fusion, are a distant hope, but not a dream. These are Prof. Colombo's practical recipes for Italy, which cannot allow itself to be kept in the dark. However, among the many problems, this is also a simple but severe appeal to save energy. Italy, turn off that light.

Electric Power Company

91MI0178Y *ITALIA OGGI* in Italian 10 Jan 91 p 33

[Text] Love you, hate you. Fortunately, this is no longer so: the nuclear issue is no longer a matter of irreconcilable hate or blind faith, at least not like it used to be. Reactors proliferated in Italy as in a large part of the world, working quietly until the Three Mile Island and Chernobyl accidents.

These were, however, useful experiences. No longer could we accept the construction of atomic reactors as they were conceived of in the past. However, Italy's energy problems have remained essentially the same as they were in 1987, the year of Italy's big "no" in answer to the referendum on nuclear energy. Perhaps, these problems have even worsened. Our dependence on energy supplies is increasing and our electricity requirements have grown by 4.9 percent. Furthermore, 15 percent of our total energy supplies comes from abroad.

So, what should we do? We spoke with Professor Giovan Battista Zorzoli, an expert on energy problems and a member of ENEL's [National Electric Power Company] board of directors. He stated that the "new nuclear energy" is interesting. "ENEL has just set aside 70 billion lire over the next three years for research in the field of passively and intrinsically safe reactors. There are three main areas to explore here," he explained. "The first two are the two reactors under study in the United States and the third is the PIUS [expansion no given] project, which has been spoken of in recent days. At the

end of the three years, perhaps we will be able to choose one of the three possibilities and decide on further developments."

But how can we overcome the "no" Italy gave to nuclear power with the referendum? "The generation of reactors we are now talking about, unlike the obsolete ones that have been closed down, will avoid the need for the evacuation of the population. Of course, accidents cannot be avoided. Radioactivity leaks from the power plant will, however, be excluded. Perhaps this will not change any ideological opposition, but it may change the degree of acceptance.

"On the other hand, even the Greens have very precise positions today. Therefore, not just any product will be proposed. The possibility of recycling fission products in those plants where they are produced is being examined. I would also add that these proposals are not going to be developed tomorrow, or the day after, but on the dawning of the year 2000." What energy must we therefore use from now until the end of the century? "A large deal of methane gas," Zorzoli explained, "petroleum with a low sulphur content, and a little coal with geothermal and hydroelectric energy being developed to the maximum."

Professor Sergio Barabaschi in charge of Ansaldo's research and the vice director of this large Genoa-based company which is strongly committed to the energy sector, explains that the studies on the PIUS project will be further investigated by the ABB-Ansaldo-Fiat consortium: "PIUS has many intrinsical safety features with interesting solutions, and meets the requirements dictated by Fermi: It is immersed in a pool of water and boron that can prevent combustion. There is also an intrinsic pressure-balancing mechanism so that any change whatsoever in optimal conditions automatically brings about the shut down of the reactor."

New scientific arguments, therefore, against consolidated positive experiences and against the fears that grew from two serious accidents, Chernobyl and Three Mile Island. There are many other problems, minor ones fortunately, that it would take too long to list here. The nuclear question is opening up again. Let us listen.

NETHERLANDS

Company Improves Soil Purification Technique

91AN0193A *Rijswijk POLYTECHNISCH WEEKBLAD*
in Dutch 20 Dec 90 p 13

[Article: "New Method To Remove Poison From Soil"]

[Text] Mosmans Mineraaltechniek, a company from Oss (Netherlands), claims to have developed a flotation process that brings the level of hexachlorocyclohexanes (HCHs) down to the detection limit of 0.01 milligrams

per kilogram. So far, the best achievement that researchers could obtain was 0.4 milligrams per kilogram.

HCHs are a group of closely related substances which used to be frequently applied in herbicides and pesticides. Although these chemicals have now been banned, more than 100,000 cubic meters of Dutch soil are presently assumed to be contaminated with HCHs.

Research on purification methods got stuck at the unacceptably high residual concentration of approximately 0.4 milligrams per kilogram. The main problem here was not the purification technique as such, but rather the analytical method which was not accurate enough to test out purification hypotheses. Based on its past experience with analytical techniques for PCBs, Mosmans succeeded in considerably improving methods to determine HCH levels. As a result, it became possible to try out the hypotheses for the removal of HCHs, which in turn led to the development of an appropriate purification method.

The process used by Mosmans to remove HCHs from soil consists in a number of successive steps: sieving, gravity separation, sludge removal, flotation, and dehydration. One of the main elements of the process is the improvement of the collectors used in the flotation process. Mosmans discovered that HCHs are absorbed by soil particles, and therefore developed a new formula enabling the collectors to extricate HCHs.

PORUGAL

Particularity in Effluent Treatment Sought

91WN0353A *Lisbon DIARIO DE NOTICIAS*
in Portuguese 19 Mar 91 p 6

[Excerpt] Yesterday in Brussels, the minister of environment, Fernando Real, maintained that the EEC should consider the characteristics of the Portuguese coast, categorizing it as "a less sensitive zone." As a result, Portugal would not be obliged to engage in a demanding treatment of effluents in the coastal regions.

Fernando Real explained: "The Atlantic, bordering the Portuguese coast, is severely affected by marine currents, which rapidly replace the water along the coast."

To reinforce this viewpoint, the minister stressed that other regions, specifically, those of the Mediterranean, take 70 years to renew their waters. He also cited the "heavily polluted" Baltic and North Sea areas.

Fernando Real remarked: "Secondary or tertiary treatment of the Portuguese coast, which is compulsory in other ecologically sensitive zones, is unwarranted." He added: "Portugal is creating programs for the execution of an advanced primary treatment."

These are, in fact, "sensitive zones," the residual waters of which require a more demanding treatment, claimed

Fernando Real. He was talking with Portuguese reporters after a meeting of the Community's Council of Environment Ministers, during which a directive setting minimal standards for urban effluent treatment starting in 1993 was discussed.

According to diplomatic sources, the Twelve understood Portugal's situation and accepted the Portuguese

environment minister's explanation. The document, aimed at protecting the environment from pollution caused by urban, municipal, and industrial residual waters, was submitted by the Commission in 1989. After several meetings at which the proposal was debated, the main unresolved problems are associated with the definition of "sensitive zones" and "less sensitive zones." [passage omitted]

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DATE FILMED

13 June 1991